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Attitude towards COVID-19 in routine dental practice

Actitud ante la COVID-19 en la práctica dental rutinaria

Víctor Marcel Aguilar Salas[1], Elena Victoria Benavides Febres[2]

[1]Universidad Católica de Santa María. Arequipa, Perú.
[2]Universidad Católica de Santa María. Hospital "III Yanahuara ESSALUD". Arequipa, Perú.

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RESUMEN

Introducción: el principal modo de transmisión de la pandemia de la COVID-19, causada por el nuevo coronavirus SARS-CoV-2, lo constituyen las pequeñas gotas de saliva expulsadas al respirar, hablar, toser o estornudar. El profesional estomatólogo está expuesto al contagio y propagación de la infección al trabajar directamente con las mucosas.
Objetivo: describir el manejo de los pacientes en la consulta de Estomatología.
Desarrollo: se revisaron 165 artículos publicados entre enero y marzo del 2020, en PubMed y guías de la Comisiones Nacionales de Salud. SE tomaron en cuenta criterios relacionados con la atención odontológica. La información obtenida concuerda en que, la mejor forma evitar el contagio y la propagación es la prevención a través de una adecuada identificación del paciente, protección personal, limpieza, desinfección y manejo de desechos.
Conclusiones: el profesional estomatólogo juega un papel importante en la prevención de la transmisión mediante el correcto empleo de normas de bioseguridad y protección.

Palabras clave: Infecciones Por Coronavirus; Transmisión De Enfermedad Infecciosa De Paciente A Profesional; Síndrome Respiratorio Agudo Grave; Equipo De Protección Personal; Higiene De Las Manos; Contención De Riesgos Biológicos; Personal De Odontología.

ABSTRACT

Introduction: the main way of transmission of the COVID-19 pandemic, caused by the novel SARS-CoV-2 coronavirus, is through small droplets of saliva expelled when breathing, speaking, coughing or sneezing. The dental professional is exposed to the spread of infection by working directly with the mucous membranes.
Objective: to describe the management of patients in the dental surgery.
Development: 165 articles published between January and March 2020 in PubMed and National Health Commission guidelines were reviewed. Considering the criteria related to dental care. The information obtained agrees that the best way to avoid contagion and spread

is prevention through the adequate identification of patient, personal protection, cleaning, disinfection and waste management.
Conclusions: the dental professional plays an important role in preventing transmission by the correct procedures of biosecurity and protection standards.

Keywords: Coronavirus Infections; Infectious Disease Transmission, Patient-To-Professional; Severe Acute Respiratory Syndrome; Personal Protective Equipment; Hand Hygiene; Containment Of Biohazards; Dental Staff.

INTRODUCCIÓN

Viruses are intracellular infectious agents much smaller than bacteria, only visible by electronic microscopy, although there are exceptions. They are small genomes of deoxyribonucleic acid (DNA) or ribonucleic acid (RNA) surrounded by a protein coat that enters a host cell, sequestering enzymes and materials from those cells to produce more copies of themselves, so they need a living host to survive and replicate.

Globalization caused an endemic viral outbreak to be rapidly transmitted and to evolve into an epidemic to a pandemic within a short time. It originated after the identification of a new, severe and atypical pneumonia that had as its common denominator the seafood market in the city of Wuhan, Hubei Province, China. [1]

Coronavirus disease 2019 (COVID-19) is caused by the new severe acute respiratory syndrome coronavirus (SARS-CoV-2), which genome is made up of a single strand of RNA. The main clinical manifestations of COVID-19 infection are: fever, chills, dry cough, difficulty in breathing, generalized myalgia, general malaise, drowsiness, diarrhea, confusion, dyspnea and pneumonia.[2,3]

It has been shown that the main way of transmission is the small droplets (micro-droplets of Flügge) expelled when breathing, talking, laughing, coughing or sneezing. The asymptomatic incubation period for people infected with the COVID-19 is about 14 days.

It is important to consider that the angiotensin-converting enzyme 2 [ACE2]is the main host cell receptor for thevirus that causes the COVID-19, and this receptor is enriched in the epithelial cells of the tongue, so the oral cavity has a potentially high risk for infectious susceptibility to the COVID-19.[4]

As it is a contagious virus and there is a lack of knowledge, the objective of this article is to describe the management of patients in routine practice by dental professionals to face the risk of the COVID-19.

Prevention

Contamination of frequently touched surfaces in healthcare environments is a potential source of viral transmission. The persistence of human coronavirus (HCoV) on a metal surface at room temperature is five days, on plastic fingers six days, on surgical-glove-latex at 21°C is equal to or less than 8 hours and on ceramic tiles up to five days in the above mentioned settings. [5, 6]

Kampf et al., [6] indicate that it can be efficiently inactivated by surface disinfection procedures with 62-71 % ethanol, 0,5 % hydrogen peroxide or 0,1 % sodium hypochlorite for 1 minute. Other biocide agents such as 0,05-0,2 % benzalkonium chloride or 0,02 % chlorhexidine digluconate, which are less effective.

Maintaining a clean and dry environment in the dental office would help decrease the persistence of the COVID-19. [7] Experts organized by the National Health Commission (NHC) for the prevention and control of the COVID-19 also indicate that the coronavirus is sensitive to ultraviolet rays and heat, and that most disinfectants can inactivate the virus, with the exception of chlorhexidine, which effect is not effective, so disinfectants containing this substance should be avoided. [8]

In many dental procedures, a cloud of spray has been evident during the use of rotary, air abrasion or triple syringe elements. The routes of infection in the dental office are: direct contact with the body fluids of an infected patient, contact with surfaces (mask, glasses, chest, operator's arm and patients' glasses) before and after dental treatments. Similarly, the contact with instruments that have been contaminated by the patient and with tiny infectious particles of the patient's saliva when speaking (even in a low voice) are routes of infection.[9]

Pathogens in blood or bloody fluids can also enter the human body through mucous membranes or damaged skin. [10] Therefore, the COVID-19 has a high capacity to spread through asymptomatic infected patients. [11] Dentists and health care personnel should take strict personal protection measures and avoid or minimize operations that may produce aerosols. As a result the four-handed technique has proved to be the most beneficial in preventing infection. [12]

Professional Approach

Professionals and staff working in the dental office, in these times of a coronavirus pandemic, need to know:
1. How infections are spread, especially the COVID-19.
2. How to identify a patient with clinical signs and symptoms of the COVID-19 infection.
3. Theprotective measures that should be taken before, during and after the dental assistance.

New or follow-up patients come to the dental office, with processes that include interview, clinical examination, diagnosis and treatment. A frequent contactbetween the patient and the professional, presupposes a risk of cross infection.[13]

Initial Assessment

Triage must be established in the initial assessment of the patient, with the objective of detecting fever. The appropriate body temperature should be below 37.3°C, and should be taken on the forehead, with a thermometer that does not have direct contact with the skin. [7] Zhiyongy et al.,[10] members of the expert group of Hubei Provincial Center for Dental Medical Quality Control, indicate that the patient should also be asked if he or she has symptoms of fever or respiratory symptoms such as cough and dyspnea or whether they use antipyretic.

Similarly, the patient should be asked about his or her history of travel or residence in epidemic areas in the last 14 days or if he or she has been in contact with patients diagnosed with PCNC (pneumonia caused by the new coronavirus), fever or patients with respiratory symptoms in the last 14 days.

Several actions can be followed based on the initial assessment and interview. If a patient is identified as having a fever during the triage, his/her personal information should be recorded, he/she should be given a mask and referred to a specialized center in the area for further examination. If the patient answers "Yes" to any of the screening questions, and his/her body temperature is below 37.3°C, the dentist may postpone the treatment for 14 days after the exposure event and direct the patient to go into home quarantine for those days.[7]

If the patient answers "Yes" to the questions and the temperature is 37.3°C or higher, the patient should be immediately quarantined and the institutions responsible for the control of the COVID-19 should be informed. If the answer is "No" to the questions, and the body temperature is below 37.3°C, the dentist can be treated with additional protective measures and avoid splashing or spraying procedures as much as possible.[7]

Patients with oral and maxillofacial trauma or infections may often have fever; this can be differentiated from that caused by the new coronavirus through epidemiological history, anamnesis, etiology, clinical examination, blood tests and other supplementary tests.[10]

Actions to take into account during the consultation

Hand Hygiene

According to existing reports, hand hygiene is an essential component of infection prevention and control, especially of the COVID-19. There are five moments for hand hygiene as indicated by the World Health Organization (WHO):

Before touching a patient, prior clean or aseptic procedures, after exposure or risk of body fluids, after touching a patient and after touching the patient's surroundings. [14]

Hand hygiene is one of the best ways to protect not only the patient, but also the dentist, the use of soap and water for at least 20 seconds is sufficient.[15] And the use of a hand sanitizerwith at least 60 % alcohol content denatures proteins and inactivates viruses, is simple and inexpensive, and prevents the cross transmission of the COVID-19.[16]

It is important to emphasize that, wearing gloves is not a substitute for hand washing, you should wash or disinfect your hands after removing your gloves. [10]

Personal Protective Equipment

The objective is that the blood of the patient or other body fluids should not come into contact with the skin or mucous membranes of the eyes, mouth and nose. Given that in the settings of the dentist office patients with the diagnosis of the COVID-19 should not be treated, primary and secondary levels of protections would be recommended:

A. Primary protection (standard protection for personnel in clinical settings): wear disposable work cap, disposable surgical mask and work clothing (white coat), use safety glasses or face shield, in addition to disposable latex or nitrile gloves, if necessary.

B. Secondary protection (advanced protection for dental professionals): use disposable medical cap, disposable surgical mask, safety glasses, face shield, and work clothes (white coat) with disposable insulating clothing or surgical clothing outside and disposable latex or nitrile gloves.

Radonovich et al.,[17] after a clinical trial, conclude that N95 respirators versus medical masks did not produce significant differences in the incidence of laboratory-confirmed influenza. NSC from the People's Republic of China indicates that it is possible to prevent respiratory infectious diseases such as novel atypical pneumonia caused by the COVID-19 and influenza, and to protect oneself, with the use of masks.

Therefore, they suggest that when a person is in a busy place such as offices, restaurants and public transportation, they should wear and use a disposable medical mask or a surgical mask.[18]

The U.S. Centers for Disease Control and Prevention (CDC) states that N95 surgical respirators (also called medical respirators) should be used only by health care personnel who need protection from hazards, both in the air and in liquids (splashes, sprays).[19]

The recommendations for the use and handling of masks from the Chinese NSC are as follows:

1. Wash your hands before use and after removing.
2. Pay attention to the front, back, up and down when wearing a mask, the mask should cover the nose and mouth, the nose clip should be adjusted to fit the face.
3. Avoid touching the inside and outside of the mask with your hands during use. Take the mask out by removing the cord at both ends.
4. The use of multiple masks cannot effectively increase the protective effect, but it increases the breathing resistance and may damage the adhesion.
5. There is no evidence to demonstrate the effectiveness of measures such as cleaning and disinfecting masks.
6. Both disposable medical masks and surgical medical masks are worn for a limited time, and cumulative use should not exceed 8 hours. Personnel who are occupationally exposed should not wear surgical masks for more than 4 hours and they cannot be reused.[18]

Meng et al., [12] indicate that because dental procedures have particular aerosol and droplet characteristics, standard protective measures would not be effective in the daily clinical work of COVID-19 infected patients, when they are in the incubation period, when they do not know if they are infected or decide on to hide their infection.

Therefore it is recommended the use of personal protective equipment (masks, gloves, gowns and glasses or face masks) to protect against (potentially) infected blood or secretions, as well as particle respirators (N-95 masks or standard FFP2 masks established by the European Union) for routine dentistry practice.

Zhiyong and et al.,[10] indicate that after the use, protective glasses and face shields they should be cleaned and disinfected with 75 % ethanol or soaked in 500 - 1000 mg/L of disinfectantcontaining chlorine for 30 minutes. Then rinse under running water, dry and use as a replacement.

Doctors must change their work clothes and if conditions exist, take a bath at the end of assistance or take a shower when they get home.

Oral Examination

Pre-procedure mouthwash and high-volume suction were effective when used alone and in conjunction, to reduce the microbial load of aerosols produced during the procedures. [20]

Because the virus that causes the COVID-19 is vulnerable to oxidation, the NSC of the People's Republic of China established theguidelines to the diagnosis and treatment of the novel coronavirus pneumonia,this organization recommends mouthwash with 1 % hydrogen peroxide.This is intended to reduce the salivary microbial load, including the possible presence of the virus that causes the COVID-19.

Besides it is recommended, the use of a rubber dam.In cases where the rubber dam cannot be used, rinsing can only help to reduce the microbial load by 70 %. The rubber dam significantly reduces the production of aerosol and saliva splashes when using a high-speed or ultrasonic hand-piece. For the latter, it is necessary to combine it with high volume suction for the application of aerosol and regular suction for saliva.

Another less effective alternative, in case the rubber dam cannot be used, could be the lip separators or mouth openers with aspiration as the Oral-Biofilter. Procedures that generate coughing, nausea, excessive salivation or saliva excretion, such as that produced in an intra-oral radiographic shot, should be minimized. It is preferable to indicate extra oral radiographs such as panoramic or Cone-Beam type tomography, in routine dental practice.

The instruments for dental use are potential sources of microbial harborage and dissemination, which implies responsible and adequate biosafety management. [22]

Although the WHO indicates that the novel coronavirus loses its infectious potential upon exposure to a temperature of 56°C for at least 30 minutes or 65°C or more, exposure for 10 minutes will neutralize other infectious agents. [22] The recommendation for dental hand-pieces is the decontamination through washing with water, detergent and the application of mechanical friction followed by sterilization in an autoclave.

The inactivation of heat-resistant bacterial spores is achieved with type B or type S autoclaves, regardless of whether or not a sterilization package is used. However, N-type autoclaves are capable of sterilizing general bacteria such as *Streptococcus Salivarius* even in a sterilization bag, but are not capable of complete sterilization when the hand-piece is inside a package. Therefore, in order to achieve efficient sterilization with N-type autoclaves, it is recommended to process them without any type of packaging.[23]

In addition, it is important to consider using anti-retraction hand-pieces to avoid aspiration of fluids that can contaminate the air and the dental unit waterlines inside the dental unit, and therefore can cause cross-infection. [24] The use of dental hand-pieces without an anti-retraction function or dental unit anti-retraction systems should be prohibited during the COVID-19 epidemic period.

Cleaning and Disinfection

The People's Republic of China NSC, for the prevention and control of Pneumonitis for Novel Coronavirus Infection, suggests:
Ultraviolet (UV) rays twice a day for at least 30 minutes and good ventilation, are effective methods of disinfecting indoor air.

To disinfect the fabrics to be reused, they should first be soaked in a disinfectant containing 500 mg/L chlorine for 30 minutes, then washed or placed in a water-soluble bag and placed in the washing machine for a period of 30 minutes, with 500 mg/Lchlorine.

To disinfect floors, walls and elevators, spray a disinfectant containing chlorine in the proportion of 500mg/L of water, chlorine dioxide or 75% ethanol.

Object surfaces should be sprayed with disinfectant containing chlorine in the ratio of 500mg/L water, chlorine dioxide or 75 % ethanol.

In suspected or confirmed cases of the COVID-19, use 1000 mg/L of disinfectant containing chlorine in water.[10]

Management of Medical Devices and Items

The standards for handling biohazardous waste, such as blood and blood products, tissues or organs removed during surgery, among others, are different for each country.

Therefore, it must respect the local rules of stages that make up the management of solid waste. These may include conditioning, primary storage, segregation, intermediate storage, internal transportation, central storage, treatment, external collection and final disposal.
It is advisable to consider every patient as potentially infected.

CONCLUSIONS

To deal with the new infections, health professionals must constantly update themselves. the COVID-19 is a recent disease, which has not been fully studied. Prevention through the correct use of biosecurity and protection protocols plays a very important role, since it facilitates work in safe conditions and allows compliance with the standards, to avoid possible infection and improve the satisfaction of the health personnel for their own benefit.

Conflict of interest
The authors declare that there is no conflict of interest.

Author Contribution
All authors contributed equally in the conception, design, writing and review of the final version of the manuscript.

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