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# CLINICAL MANAGEMENT IN THE TREATMENT OF THE NEW CORONAVIRUS – COVID-19: LITERATURE REVIEW

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**Abstract**: Recently, in December 2019, the transmission of a new coronavirus (SARS-CoV-2) was identified in Wuhan, China, which caused COVID-19, which was then disseminated and transmitted from person to person. COVID-19 is a disease caused by the coronavirus - SARS-CoV-2, with a clinical spectrum ranging from asymptomatic infections to severe cases. Coronaviruses are common in many different species of animals, including camels, cattle, cats and bats. According to the World Health Organization, the majority (about 80%) of patients with COVID-19 may be asymptomatic, and approximately 20% of detected cases require hospital care due to respiratory distress, of which approximately 5% may require ventilatory support.
**Keywords:** Coronavirus. New Coronavirus. COVID-19. Virus. Pandemics. Precautions.

## INTRODUCTION

In human history, there is a very old relationship between epidemic diseases and men, even with all the process of technological evolution, individuals remain totally connected to the natural world. The purpose of the Ecological/Environmental story is: to understand how human action directly affects the environment and the consequences generated due to this. It also aims to understand how human beings are affected by their natural environment, over time (WORSTER, 2002, p.25 apud KLAJMAN, 2015).

The main pandemics, that is, those that had the greatest impact on human demography, are mostly identified in Western literature, starting in the sixth century with the Plague of Justinian (Bubonic Plague), then in the sixteenth century with the Black Death and arriving in the twentieth century with the 1918 flu, also known as the Spanish flu (MENHORAS, 2020).

Infectious diseases have the ability to generate major impacts on a global scale, in the twentieth century the Spanish flu pandemic (influenza) brought thousands of victims to death. The dissemination by the media of the first deaths due to the influenza pandemic in 2009 exposed the difficulty of information about the efforts of health authorities to combat the spread of the pandemic (KOLATA, 2002, p.71 apud KLAJMAN, 2015).

The emergence of a new coronavirus, which crossed species to contaminate human beings, was the news that started the year 2020. This virus, tentatively named 2019-nCoV, was first seen in Wuhan, Hubei Province, China, in workers at a seafood and live animal market. Other outbreaks caused by two other human respiratory coronaviruses appeared two decades ago (SARS-CoV, MERS-CoV), the new coronavirus COVID-19 causes severe respiratory illness in some individuals. After the report by the Chinese health authorities of thousands of confirmed cases and hundreds of deaths attributed to the new coronavirus COVID-19, as well as the detection of cases in several countries, especially contaminating adults over sixty years old and carriers of pathologies. (BRAZILIAN SOCIETY OF PEDIATRICS, 2020).

Coronaviruses have RNA as their genetic material, and are widely distributed among humans, other mammals and birds. When visualized by the electronic microscope, these viruses are seen as circles, with spicules that come out, similar to a crown (the word "corona" in Latin means crown) (figure 1). They belong to the Coronavirinae subfamily of the Coronaviridae family, order Nidovirales, including four genera: Alfacoronavirus, Betacoronavirus, Gamacoronavirus and Deltacoronavirus (BRAZILIAN SOCIETY OF PEDIATRICS, 2020).

The new coronavirus 2019 (On January 12, 2020, the World Health Organization temporarily named the new virus as Novel

Coronavirus 2019 - 2019-nCoV and on February 12, it named it definitively as COVID-19), the seventh to be described as a cause of disease in humans (BRAZILIAN SOCIETY OF PEDIATRICS, 2020).

However, the sequencing of the viral genome was very rapid, being 75% to 80% identical to SARS-CoV and even more closely related to bat coronaviruses. Detailed knowledge of the antigenic characteristics of this new coronavirus is of crucial importance, as it enables the creation of diagnostic tests allowing rapid identification of the virus, as well as the development of serological assays to map the domain of infection in a given community, and also for the development of specific antivirals and vaccines in the near future (BRAZILIAN SOCIETY OF PEDIATRICS, 2020).

However, it is necessary to understand that the elements available so far are preliminary and there is still much to study about the action of this new coronavirus, its transmissibility, potential virulence, and spectrum of clinical manifestations (BRAZILIAN SOCIETY OF PEDIATRICS, 2020).

Based on experience with SARS-CoV and MERS-CoV, it is likely that the transmission of the new COVID-19 coronavirus will occur at a lower intensity and competence through aerosols and fomites and more through droplets, thus anticipating the importance of implementing health measures public health, including social isolation, appropriate diagnosis and careful adherence to universal precautions in health environments, to mitigate the transmission of COVID-19 (BRAZILIAN SOCIETY OF PEDIATRICS, 2020).

SARS-CoV was responsible for outbreaks of severe acute respiratory syndrome in the years 2022 and 2003 in China, 8,096 cases in 29 countries and 764 deaths (9.5% lethality), while MERS -CoV was the agent responsible for a severe respiratory outbreak in the year 2012 in the Middle East, recording 2,494 cases in 27 countries and 858 deaths (34% lethality) (BRAZILIAN SOCIETY OF PEDIATRICS, 2020).

The high prevalence of coronaviruses, with wide distribution in the world, combined with their genetic diversity and frequent genomic recombinations, in places with intense interaction between man and other animals, is a scenario that facilitates the periodic emergence of new strains of coronavirus (SOCIEDADE BRASILEIRA DE PEDIARY, 2020).

## MATERIAL AND METHODS

A bibliographic review was carried out on the subject in scientific academic journals available online such as: Google Scholar, SciELO, Ministry of Health platform, ANVISA and Sociedade Brasileira of Pediatrics in the year two thousand and twenty, gathering and comparing the different data found in the consultation sources for the technical-scientific foundation that would allow identifying the correct clinical management for the treatment of the new coronavirus.

## THE CLINICAL MANAGEMENT OF THE NEW CORONAVIRUS – COVID-19

Coronaviruses cause respiratory and intestinal infections in humans and animals. Most coronavirus infections in humans are caused by species of low pathogenicity, leading to the development of symptoms of the common cold, however, they can eventually lead to serious infections in risk groups, the elderly and children. The clinical spectrum of human infection with the new coronavirus (2019-nCoV) has not been fully described and the pattern of lethality, mortality, infectivity and transmissibility is not known. Currently, the treatment is nonspecific support, there

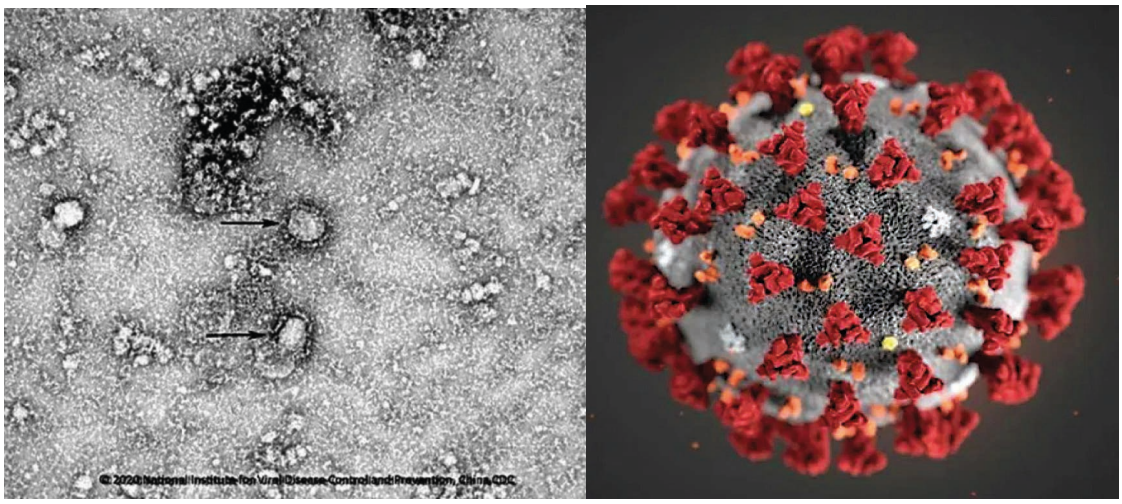


Figure 1 -Microscopy image of the novel coronavirus COVID-19 (provided by the China CDC).

Source: Brazilian Society of Pediatrics (2020, p. 02).

| Patients who fulfill the following criteria must be defined as suspected cases for COVID-19 | | |
|---|---|---|
| Clinical characteristics | | Clinical characteristics |
| Fever OR at least one respiratory sign/symptom (cough, shortness of breath, nose flapping, etc.) | E | history of close contact with a laboratory confirmed case of the novel coronavirus (COVIDE-19) in the last 14 days before onset of signs or symptoms |
| Fever and at least one respiratory sign/symptom (cough, shortness of breath, nose flapping, etc.) | E | Fever and at least one respiratory sign/symptom (cough, shortness of breath, nose flapping, etc.) |
| Fever and at least one respiratory sign/symptom (cough, shortness of breath, nose flapping, etc.) | E | history of travel to an area with local transmission, according to the WHO, within the last 14 days before the onset of signs or symptoms |

*Fever may not be present in some cases, for example, in young, elderly, immunosuppressed patients or in some situations who may have used antipyretic medication. In these situations, the clinical evaluation must be taken into account and the decision must be recorded in the notification form.*

Table 1 -Operational definition of a suspected case for the new coronavirus 2019 (COVID-19), according to the Brazilian Ministry of Health.

Source:Brazilian Society of Pediatrics (2020, p. 05).

is still no vaccine or specific drugs available (MINISTRY OF HEALTH, 2020).

## ETIOLOGICAL AGENT OF COVID-19

The etiological agent is from the order Nidovirales of the Coronaviridae family, it is an RNA virus. The SARS-CoV, MERS-CoV and 2019-nCoV viruses are from the Betacoronavirus subfamily that only infect mammals; are highly pathogenic and cause respiratory and gastrointestinal syndrome. In addition to these three, there are four other types of Coronavirus that can cause illness in the upper and eventually lower respiratory tract in immunosuppressed patients, as well as affecting mainly children, patients with comorbidities and the elderly. (MINISTRY OF HEALTH, 2020).

## RESERVOIR AND MODE OF TRANSMISSION

The evidence regarding the mode of transmission of this new coronavirus is not clear. The transmission of other human coronaviruses from one person to another happens especially by air, by droplets when talking, coughing, sneezing, by close contact such as shaking hands or touching a contaminated object and bringing your hand to your mouth, nose and eyes. Oro-fecal transmission was rarely reported. The transmission of this new coronavirus COVID-19 seems to happen especially through contact with a contaminated person, through respiratory droplets generated when the person coughs, sneezes, or through droplets of saliva or nasal secretion. The survival time of this new coronavirus in environments and objects is still unknown and whether there is transmission by fomites (BRAZILIAN SOCIETY OF PEDIATRICS, 2020).

There are no scientific studies, so far, proving that there has been intrauterine transmission or transmission through breast milk of this new virus (BRAZILIAN SOCIETY OF PEDIATRICS, 2020).

For a better understanding of the risk associated with 2019-nCoV, it is important to clarify that the ease with which a virus spreads from person to person can vary. Some viruses are highly transmissible, while others are less transmissible (MINISTRY OF HEALTH, 2020).

## INCUBATION PERIOD AND TRANSMISSIBILITY

The incubation period for the new coronavirus (COVID-19) is approximately five days, although we have cases with up to two weeks from contamination to the onset of symptoms. The beginning of the transmissibility period is still not very clear, and most of the secondary cases occurred from symptomatic individuals. Preliminary reports indicating the probability of transmission from asymptomatic individuals were lately questioned regarding the methodology used, and it is not clear on this occasion whether this form of transmission is associated with the new coronavirus COVID-19 (SOCIEDADE BRASILEIRA DE PEDIATRIA, 2020).

The transmissibility of patients infected with SARS-CoV is on average 7 days after the onset of symptoms. However, recent data on the New Coronavirus (2019-nCoV) suggest that transmission can occur, even without the appearance of signs and symptoms (MINISTRY OF HEALTH, 2020).

It is important to emphasize that the exact time of elimination of the virus in the upper and lower respiratory tract of infected patients is still unknown, but the estimate is weeks, compared to what was observed in cases of MERS-CoV and SARS-CoV infection.

In the case of SARS-CoV, the transmissibility of infected patients is on average seven days after the onset of symptoms (SOCIEDADE

BRASILEIRA DE PEDIATRIA, 2020).

**SUSCEPTIBILITY AND IMMUNITY**

Because it is a new virus, susceptibility is general. As for immunity, it is not known whether the infection in humans that did not progress to death will immunize them against new infections and whether this immunity is for life. It is known that the increase in the number of cases is closely linked to transmissibility and susceptibility (MINISTRY OF HEALTH, 2020).

**CLINICAL MANIFESTATIONS**

Clinical evidence of coronavirus infection is abundantly wide, ranging from a simple cold to severe pneumonia. However, this new coronavirus does not yet have its spectrum established, requiring further investigations and time to differentiate the disease (MINISTRY OF HEALTH, 2020).

According to the most current information, the clinical signs and symptoms of infection with the new coronavirus are especially respiratory. The patient may have fever, cough and difficulty breathing. An updated evaluation of 99 patients with pneumonia and laboratory diagnosis of 2019-nCoV admitted to the hospital in Wuhan, China, points to a higher rate of hospitalization in males over fifty years of age. The main symptoms consist of fever (83%), cough (82%), shortness of breath (31%), muscle pain (11%), confusion (9%), headache (8%), sore throat (5%), rhinorrhea (4%), chest pain (2%), diarrhea (2%), and nausea and vomiting (1%). According to imaging studies, 74 patients (75%) had bilateral pneumonia, 14 patients (14%) had multiple spots and ground-glass opacity, and 1 patient (1%) had pneumothorax.MINISTRY OF HEALTH, 2020).

**COMPLICATIONS**

The most common complications of the infection caused by Covid-19 are Severe Acute Respiratory Syndrome - SARS (17-29%), acute cardiac injury (12%) and secondary infection (10%). Mortality among hospitalized patients ranged between 11% and 15% (MINISTRY OF HEALTH, 2020).

**DIAGNOSIS**

The initial clinical picture of the disease is marked as a flu-like illness, however, mild, febrile initial cases may progress to a progressive rise in temperature and the fever is constant for more than three to four days, contrary to what was observed in the case of Influenza. Diagnosis depends on clinical-epidemiological investigation and physical examination (MINISTRY OF HEALTH, 2020).

In addition to clinical diagnosis, laboratory diagnosis can be performed to identify the 2019-nCoV virus using RT-PCR techniques and partial or total sequencing of the viral genome (MINISTRY OF HEALTH, 2020).

**SERVICE AND TREATMENT**

There is no medicine for the treatment of human infection with the new Coronavirus at the moment, but support measures need to be implemented (MINISTRY OF HEALTH, 2020).

All patients who are discharged during the first week of the onset of the clinical picture (any symptom independent of fever) must be alerted to the likelihood of a later worsening of the picture and warning signs of complications such as: manifestation of fever (there may be initial cases afebris), rise or recrudescence of fever or respiratory signs, tachycardia, pleuritic pain, fatigue, dyspnea (MINISTRY OF HEALTH, 2020).

Suspected or confirmed cases for 2019-nCoV (Table 1) that do not require hospitalization and the health service opts for home isolation, the doctor may request

chest X-ray, blood count and biochemical tests before being sent home depending on the evaluation patient's clinic. These patients must receive guidance on infection control, prevention of transmission to contacts and warning signs for possible complications, and access through rapid communication must be provided for any questions or communications. The presence of any sign must follow the precautionary measures recommended by the health team responsible for the alert service, which must determine the return and immediate hospitalization of the patient. However, it is necessary to evaluate each case. (MINISTRY OF HEALTH, 2020).

For immunocompromised patients, hospitalization and analyzing the probability of reproducing the PCR (molecular test) before hospital discharge or transfer to a ward room without isolation is advised, due to the possibility of temporized excretion (MINISTRY OF HEALTH, 2020).

Patients who require prolonged hospitalization due to different comorbidities also need to have PCR (molecular test) reiterated for eventual release from isolation, regardless of the absence of fever and hospital symptoms (MINISTRY OF HEALTH, 2020).

## CLINICAL MANAGEMENT OF NOVEL CORONAVIRUS RESPIRATORY SYNDROME (2019NCOV)

For the clinical management of respiratory syndrome caused by COVID-19, it is necessary to administer early supportive therapy and monitoring, such as: Promptly installing supplemental oxygen therapy to patients with respiratory distress, hypoxemia or shock; use in SARS patients conservative fluid treatment when there is no evidence of shock and administer antimicrobials within one hour of initial assessment of patients with sepsis and empiric antimicrobials to treat all likely pathogens causing the syndrome. Systemic corticosteroids for the treatment of viral pneumonia or SARS outside clinical trials must not be administered routinely, unless indicated for another reason (MINISTRY OF HEALTH, 2020).

Patients with SARS must be closely monitored for signs of clinical complications such as respiratory failure and rapidly progressing sepsis. The patient's comorbidities must be understood for individualized care and prognosis. It is necessary to maintain good communication with the patient and family (MINISTRY OF HEALTH, 2020).

## PREVENTION AND CONTROL MEASURES

The implementation of standard precautionary measures is the best method for preventing spread between patients and health professionals, it must be prioritized in all patient care, in pre-, during and post-hospital care, regardless of the risk factor or pathology, the focus is on minimizing exposure to respiratory pathogens, including COVID-19 (MINISTÉRIO DA SAÚDDE, 2020).

There is currently no vaccine for COVID-19, and the best form of prevention is to avoid exposure to the virus. Preventive actions that help prevent the spread of the respiratory virus, such as:Keep your hands sanitized frequently with soap and water or 70% alcohol gel; wash your hands before touching eyes, nose and mouth; avoid contact with sick people; cover your nose and mouth when coughing or sneezing with your elbow; avoid contact with people when you are sick, stay at home; disinfect surfaces and objects frequently with alcoholic solution(MINISTRY OF HEALTH, 2020).

## RECOGNITION AND CLASSIFICATION OF PATIENTS WITH NOVEL CORONAVIRUS RESPIRATORY SYNDROME

Patients who seek any health service must undergo clinical screening, which will collect data and recognize possible suspicious cases, and if necessary, will be immediately forwarded to an area isolated from other patients (MINISTRY OF HEALTH, 2020).

The attention of health professionals is indispensable in care, it is necessary to immediately identify possible suspected cases during patient care, it is also necessary to provide surgical masks to those who have respiratory symptoms. During the consultation, it is necessary to explain to the patient the initial diagnostic hypothesis, considering the symptoms of covid-19 and the possible signs of seriousness (MINISTRY OF HEALTH).

## PERSONAL PROTECTIVE EQUIPMENT

### *SURGICAL MASK*

The surgical mask is an PPE whose function is to protect the mouth and nose against respiratory droplets, it must be used mainly when acting, in patients with suspected or confirmed COVID-19, keeping a distance of less than 1 meter (MINISTRY OF HEALTH, 2020):

### *RESPIRATORY PROTECTION MASK*

This mask must be used when there is contact with patients who are at risk of generating aerosolized respiratory fluids. The mask must have a minimum filtration of 95% of particles up to 0.3 (type N95, N99, N100, PFF2 or PFF3). The equipment is for individual use, it cannot be shared, the way of use must follow the manufacturer's instructions (MINISTRY OF HEALTH, 2020).

### *GLOVES*

Procedure gloves are recommended for use when there is contact with secretions, body fluids, excretions, blood and mucous membranes, non-intact skin and contaminated articles. The glove is intended to reduce the risks of transmission of the new coronavirus between health professionals and patients. When performing a procedure that requires aseptic technique, sterile gloves or surgical gloves must be used (MINISTRY OF HEALTH, 2020):

### *EYE PROTECTION OR FACE SHIELD*

These PPE's must be used when health professionals are exposed to bodily secretions, blood spatter and excretions. This equipment is for individual use, and the user is responsible for cleaning and disinfecting it, it is recommended to disinfect with sodium hypochlorite or any other substance recommended by the equipment manufacturer (MINISTRY OF HEALTH, 2020).

### *CLOAK OR APRON*

This equipment must be made of impermeable material, used in procedures with risk of exposure to blood spatter, secretions, excretions or body fluids. The apron/cloak must have long sleeves with elasticated cuffs and a back opening. It is important that the material of this product must be of good quality, providing comfort and safety for the user, it must be available in all sizes (MINISTRY OF HEALTH, 2020).

This equipment must be discarded after use and removed before leaving the environment in which the procedure was performed. After removing the PPE, hand hygiene is necessary to avoid possible transmission of viruses to professionals and patients, or even to the environment in which you are (MINISTRY OF HEALTH, 2020).

***ISOLATION***

In suspected or confirmed cases of COVID-19 infection, it is recommended that isolation be carried out in a private, closed and ventilated room. In situations where the health service does not have private rooms or does not have a sufficient number of beds for care, it is necessary to proceed with isolation by cohort, where it separates the same ward sector and places all patients with suspected or confirmed COVID-19. 19. Beds must maintain a minimum distance of 1 meter and restrict maximum access to the area, including visitors (MINISTRY OF HEALTH, 2020).

Health professionals who act directly in the fight against the new coronavirus must work exclusively in the isolation area, avoiding contact with other areas of assistance (MINISTRY OF HEALTH, 2020).

Isolation areas must be correctly marked, including precautionary measures: standard, by droplets, by contact or by aerosols (ANNEX A) (MINISTRY OF HEALTH, 2020).

**NOTIFICATION**

According to Annex II of the International Health Regulations, human infection with the new coronavirus (2019-nCoV) is classified as a PHEIC (Public Health Emergency of International Concern), that is, it is a public health phenomenon of immediate notification (MINISTRY OF HEALTH, 2020).

Consolidation Ordinance No. 04, annex V, chapter I, section I determines that the notification must be made within 24 hours from the moment the case was recognized, suspicious or positive. Communication must be carried out by the fastest means of communication available. Available in (http://j.mp/portariadeconslidacao4ms) (MINISTRY OF HEALTH, 2020).

Notification of suspected cases of infection by the new coronavirus or other health events must be carried out by the following means available by the CIEVS Network (MINISTRY OF HEALTH, 2020):

a) Telephone Means: If the care units in the municipality or state have the structure and flows to respond to epidemiological emergency notifications, the professional must notify the local surveillance services, according to the hierarchy of the SUS;

b) National Telephone Means: CIEVS offers a free 24-hour answering service every day of the week to health professionals, called Dial Notification (0800-644-6645), through this service the health professional receives guidance from a trained technician, to give proper referral according to protocols established by SUS for local investigation through the National Network of Alert and Response to Emergencies in Public Health (CIEVS);

c) Notification by Electronic Means: CIEVS e-mail: e-notifica (notifica@saude.gov.br);

d) Mobile version of FormSUS: ForSUScap (https//redcap.saude.gov.br), this electronic medium was implemented in 2019, where the platform offers several applications for mobile devices. This platform is not an information system.

## RESULTS AND DISCUSSIONS

In late 2019, a new coronavirus, now designated SARS-CoV-2, was identified as the cause of an outbreak of acute respiratory illness in Wuhan, a city in China. In February 2020, the World Health Organization (W.H.O.) designated the disease as COVID-19 a public health emergency in late January 2020 and characterized it as a pandemic in March 2020. twenty.

COVID-19 must be considered primarily in patients with fever and/or respiratory tract symptoms who reside in or have traveled to areas with community transmission or who have had recent close contact with a confirmed

or suspected case.

In addition to testing for other respiratory pathogens, a nasopharyngeal specimen must be collected for reverse transcription polymerase chain reaction (RT-PCR) testing for SARS-CoV2.

Upon suspicion of COVID-19, infection control measures must be implemented and public health authorities notified.

Management for the control and treatment of the novel coronavirus consists of supportive care, although investigative approaches are being evaluated.

Home care may be possible for patients with mild disease who can be adequately isolated in the clinic.

To reduce the risk of community transmission, individuals must be advised to wash their hands frequently, practice respiratory etiquette (covering their mouth with their elbow when coughing), and avoid crowds and close contact with sick individuals if possible. Social distancing is recommended, especially in places with community transmission.

## CONCLUSION

Through this bibliographical research, it was noted that there is a wide variety of documents and materials available that contributed to this literary review that addresses the norms of clinical management for the treatment of the new coronavirus (Covid19).

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