

RESEARCH ARTICLE

COVID – 19 Pandemic and the Eye

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Abstract

The pandemic of COVID-19, named by World Health Organization (WHO) SARS –CoV-2, revealed a novel type of corona virus. Gradually, starting from December 2019 in China, the data about the symptoms and systemic involvement started to be collected from medical centers all over the world. As far as now, it is known that the virus involves upper respiratory tract , lungs, kidneys, gastrointestinal system, coagulation system, brain and eye. In this review we present the clinical aspects of the eye and findings in patients hospitalized with severe condition as result of SARS-CoV-2 infection. There are reports of sporadic cases of people who presented conjunctivitis which is called "pink eye". According to different sources of information, the eye is involved in COVID-19 pandemic in 1% - 3% of cases actively involved.

1.Introduction

At present the COVID-19 spread in 127 countries. The last global report, dated May 7th 2020, presents the total number of infected people 3,846,510, 265,877 deaths (6,9%), recovered 1,315,780 (34%). The leading is USA with 1,263,243 infected people, 74,810 deaths (5.9%), 213,109 recovered (16,8%). The COVID-19 is highly infectious and considered to be transmitted mainly through respiratory droplets and contact with infected persons ^(1,2,3). The possibility of feco-oral and aerosol transmission is today studied⁽⁴⁾. In the literature an article published in 2004 presented that tears of SARS patients, at that time, tested positive for viral nucleic acid⁽⁵⁾ and in the first cases, discovered in Wuhan, the chromosome of SARS-CoV-2 was 82% similar to that of SARS-Co-V⁽⁶⁾.

2. Conjunctivitis (Pink Eye)

The first case of suspected eye infection by COVID-19 was published in 24 January, 2020. Beijing News. A physician treated a COVID-19 infected patient without wearing protective goggles⁽⁷⁾. This publication was followed by an article in Lancet which mentioned that the transmission of COVID-19 through the ocular surface must not be

ignored⁽⁸⁾. The first prospective interventional case series that was published in February 2020 was designed at the First Affiliated Hospital of Zhejiang University, China. It was run from January 26, 2020 to February 9, 2020. The intent of the study was to evaluate the corona virus in tears and conjunctiva secretions of patients with SARS-CoV-2 infection.⁽⁹⁾

The study included 30 patients with diagnosed COVID-19 pneumonia. Only one patient presented conjunctivitis having a pink aspect of the conjunctiva. Sputum samples from each patient and a conjunctiva swab technique to collect tears and conjunctiva secretion was used. The samples were evaluated by RT-PCR protocol. All patients presented sputum positive to SARS-CoV-2. Except one patient, who presented pink eye, and conjunctiva secretion positive to SARS-CoV-2, all other 29 patients were negative. The patient with "pink eye" had no fever, no respiratory symptoms when the conjunctiva specimen was collected. The conjunctivitis was characterized by viral conjunctivitis with conjunctiva congestion and aqueous secretion. The patient had no fever or respiratory symptoms when they collected the specimens. The course of the disease was in the early stage of only 3 days. No viral RNA was detected in the tear fluid and

conjunctiva secretions of the severe or common-type patients without conjunctivitis. Sporadic cases were reported in Europe .The first case of conjunctivitis in Italy was a 67 old lady who returned from Wuhan. She was hospitalized in Milano and found to have respiratory distress, cough and red eyes with tearing. Tears were found positive for COVID-19. The tears were positive for 27 days the day of release from hospital. As it seems that conjunctivitis in diagnosed COVID-19 patient is rare relatively, when compared to other more common symptoms as cough , shortness of breath, fever and others, we must be aware that not every "pink" eye should be diagnosed as COVID-19 conjunctivitis.

3.Contact lens during COVID-19 pandemic

Should you stop wearing contact lenses to prevent coronavirus ?

The American Academy of Ophthalmology (AAO) recommends contact lens switch to glasses to help stop the spread of coronavirus⁽¹⁰⁾. In its official News Letter from April 11th , 2020 a detailed report regarding this issue was published. Both the World Health Organization (WHO) and the Centers for Disease Control and Prevention recommend people avoid touching their faces

to prevent and slow the spread of respiratory diseases, and may extend to wearing contacts. An article on the AAO website says that "Contact lens wearers touch their eyes more than the average person". The author of the article (R.K.) interviewed Dr. Sona S. Tuli who said:"Consider wearing glasses more often, especially if you intend to touch your eyes a lot when your contacts are in. Substituting glasses for lenses can decrease irritation and force you to pause before touching your eye.If you continue wearing contact lenses, follow hygiene rules. Experts also say that wearing glasses can act as a barrier to airborne droplets of the respiratory virus ,although they do note that the virus can still enter the eye through the sides of glasses.

Eye Care During the COVID-19 Pandemic

This section of the news letter(created by RM,SST,AD) inform eye doctors about the ways coronavirus can spread through the eyes. As far as today it is observed that COVID-19 causes mild to severe respiratory illness .Symptoms such as fever ,cough and shortness of breath can develop pneumomia and die from complications of the illness.

Eye must be protected and not exposed because:

An infected person with COVID-19 can be asymptomatic and spread the virus while

talking .Virus particles are sprayed in the air and may arrive to your face .You are most likely to inhale these droplets through your mouth and/or nose and they may reach your eyes.

You can also become infected while touching surfaces that have virus on it like table, shelf, doorknob and touching your eyes at end.

4. Conclusion

Screening of the literature regarding infection of the eye during pandemic of COVID-19 reveals COVID -19 conjunctivitis diagnosed in 1% - 3% of the series reported

Tears must be checked (best by RT-PCR) for positive virus RNA for true diagnosis

The conjunctivitis has the appearance of any other viral conjunctivitis presenting "pink eye", tearing and congested conjunctiva

The conjunctivitis can mimic also allergic conjunctivitis

The way of contamination is still an enigma and theories are:

Spread to the eyes by virus droplets from outside sources

Touching the eye with the hand infected by the virus

The virus infiltrates in the lacrimal glands and is secreted in the tears

My personal other theory is : The tight communication between the oral and pharynx spaces and conjunctiva by a lacrimal canal (which collect the tears) may allow the virus to migrate from the throat and nose through the lacrimal canal to the eye.

People must take care and avoid touching the face and protect the eyes

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