

Ocular manifestations of COVID-19 disease

Abstract

The highly contagious novel coronavirus 2019-nCoV is a new strain not previously identified in humans. Also known as coronavirus 2 (SARS-CoV-2), this virus causes a severe acute respiratory syndrome and has had widespread impact gaining pandemic status by the World Health Organization. There have been reports on the ocular manifestations of infection with this virus and this article provides a mini review of the published data.

Keywords: SARS-CoV-2, COVID-19, ocular manifestations, conjunctivitis, red eyes, tearing

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Abbreviations: WHO, world health organization; SARS, severe acute respiratory syndrome; RNA, ribonucleic acid; AAO, american academy of ophthalmology

Introduction

COVID-19/Coronavirus Disease, a severe respiratory illness caused by the highly contagious novel coronavirus 2019-nCoV, is a new strain not previously identified in humans. The coronavirus 2 (SARS-CoV-2), a positive-sense single stranded RNA virus, causes a severe acute respiratory syndrome, which has affected more than 4 million people globally. On 11th March 2020, the World Health Organization declared COVID-19 a pandemic (WHO 2020). The most common symptoms of COVID-19 are fever, dry cough, shortness of breath, fatigue, loss of appetite, and body aches. However, albeit rare, SARS-CoV-2 has also been found to cause conjunctivitis. This article will highlight the ocular manifestations of SARS-CoV-2.

Methods

A mini-review of the current published data.

Discussion

As the data continues to evolve, anecdotal reports have shown that conjunctivitis may indeed be a manifestation of SARS-CoV-2. According to the American Academy of Ophthalmology,¹ 1% - 3% of persons with confirmed SARS-CoV-2 will have conjunctivitis, either as the initial presenting illness or during the advanced phase of the COVID-19 illness.^{1,2} Some common reported ocular symptoms in patients with conjunctivitis and confirmed SARS-CoV-2 include: itching, redness, tearing, discharge, and foreign body sensation.³ Symptoms of the viral conjunctivitis caused by SARS-CoV-2 can closely resemble those seen in other types of conjunctivitis such as allergic conjunctivitis. It is therefore essential during this SARS-CoV-2 pandemic to be able to distinguish between the viral conjunctivitis caused by SARS-CoV-2 and other types like allergic conjunctivitis. Some notable differences are that allergic conjunctivitis is typically seasonal, occurring around the same time each year, whereas viral conjunctivitis is usually an isolated incident. Additionally, viral conjunctivitis caused by SARS-CoV-2 will usually be accompanied by the main symptoms of SARS-CoV-2 such as fever, cough, shortness of breath, fatigue, loss of appetite, and body aches.¹

Studies of patients with confirmed SARS-CoV-2 and conjunctivitis

One study by Wu et al.(2020) showed that of 38 confirmed COVID-19 hospitalized patients in China, 12 had conjunctivitis that manifested as conjunctival hyperaemia, chemosis, epiphora, or increased secretions. Xia et al.⁴ showed that one patient of 30 confirmed COVID-19 patients at the First Affiliated Hospital of Zhejiang University in China, had conjunctivitis. Sun et al.⁵ revealed that 2.78% of 72 patients with confirmed SARS-CoV-2 had conjunctivitis. Another study by Guan et al.² conducted in thirty hospitals across China, showed that 0.8% of 1,099 hospitalized patients with confirmed COVID-19 had conjunctival congestion. Additionally, a case report by Chen et al.⁶ described a 30-year-old man with confirmed COVID-19, who developed bilateral acute conjunctivitis 13 days after illness onset. In yet another case report by Daruich, Martin, and Bremond-Gignac,⁷ a 27-year-old man who initially presented with symptoms of conjunctivitis such as foreign body sensation, redness, and eyelid swelling, subsequently tested positive for SARS-CoV-2.

Moreover, many studies have revealed that SARS-CoV-2 can be found in ocular secretions or tears.^{4-6,8,9} The likelihood however, of SARS-CoV-2 being readily transmissible via ocular secretions is low.¹⁰ Nevertheless, contact with infectious aerosols or droplets from the ocular mucosa is a reported mode of transmission for SARS-CoV-2. Furthermore, the eye can also be the route or entry point of infection with SARS-CoV-2.¹¹ This process was believed to be the route of transmission for Guangfa Wang, a Chinese Medical Expert, who upon visiting a Wuhan Fever Clinic wearing an N95 mask but no protective eyewear, was infected with SARS-CoV-2, that initially presented as conjunctivitis.¹² Therefore it is highly recommended that protective eyewear, such as goggles or face shields, be worn in addition to an n95 mask when interacting with confirmed cases of SARS-CoV-2 Sun et al.⁵

Conclusion

This mini review of the current literature confirms conjunctivitis as the main ocular manifestation of SARS-CoV-2 disease. The symptoms can mimic those of other forms of conjunctivitis such as allergic conjunctivitis but the distinguishing features of SARS-

CoV-2 conjunctivitis from other similar forms of conjunctivitis are the concurrent respiratory tract symptoms of SARS-CoV-2. Studies have also confirmed the presence of the virus in the tears of infected individuals hence, even though rare, the eyes can be considered a mode of transmission. The ocular surface can also be a potential route for acquiring infection with this disease and for that reason, strong emphasis is placed on the need for protective eye wear when seeing SARS-CoV-2 positive patients or suspected cases.^{13,14}

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Conflicts of interest

We declare no conflicts of interest.

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