



A CASE REPORT OF SARS-CoV2 RELATED CONJUNCTIVITIS FROM LUCKNOW, INDIA

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ABSTRACT

Background: SARS-CoV2 virus from the coronavirus family has largely been responsible for the outbreak of the pandemic of 2020. The main route of infection is through the respiratory tract but other routes are too implicated in its spread. The disease manifests itself as fever, cough malaise and myalgia but atypical symptoms are also sporadically placed. One of them is conjunctivitis and such patients have tested positive on RT PCR for SARS- Cov2. However, it is unclear whether the transmission is through the ocular fluids and secretions.

Objective: SARS-CoV2 associated conjunctivitis maybe the sole presenting symptom in patients suffering from COVID 19

Material and Methods: In this report, conjunctivitis is seen as the sole symptom of a COVID-19 in a health care worker. The patient presented to the ophthalmology clinic due to redness, watery discharge, and photophobia for one day in the right eye. The patient did not have fever, cough, dyspnoea, or malaise. Antigen Test for COVID 19 was negative but RT-PCR test showed a positive result for SARS-CoV2 virus.

Result: The present case shows that conjunctivitis may occur as the only manifestation of COVID-19.

Conclusion: Conjunctivitis cases should be carefully evaluated by health professionals especially during this ongoing pandemic as it may be the only clue to detect patients suffering from COVID 19 and this can play an important role in curbing the disease to a certain extent.

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INTRODUCTION

Coronavirus disease 2019 (COVID-19) is a highly contagious disease spread by the novel a member of the corona virus family called Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2). The same family of SARS-CoV and MERS-CoV viruses and causes Coronavirus Disease 2019 (COVID-19) COVID-19 has become one of the greatest global pandemics of the 21st century. the persistent and surging threat of this pandemic warrants for clinical care within our health systems.^{1,2,3}

COVID 19 infection is an atypical pneumonia like infection in which transmission occurs during close contacts when small droplets reach mucosal surfaces through the mouth, nose or eyes. Minute sized droplets are released in the air every time a person sneezes, coughs, or talks. Common symptoms presenting are fever, cough, and shortness of breath. Clinical course varies from complete asymptomatic presentation to pneumonia and severe ARDS.^{3,4,5}

Angiotensin-converting enzyme 2 receptor (ACE2) is implicated to be the port of entry for SARS-CoV-2 which is present at various places in the body including the conjunctiva. Hence the renin angiotensin system (RAS) is affected too. As SARS-CoV-2 gains entry into the cell, it results in down regulation of ACE2 and upregulation of the classic RAAS pathway leading to angiotensin II and aldosterone production. Increase in severity of COVID-19 infections, require more intensive care unit (ICU) admissions.^{5,6,7}

The eyes are also an important point of entry for many respiratory viruses, including coronaviruses.⁸ Lack of eye protection gear were associated with an increased risk of SARS coronavirus transmission from infected patients to health care workers also during the 2003 Toronto SARS outbreak. Another study done in 2003 also indicated that healthcare workers suffered from a higher risk of SARS infection when there was unprotected eye contact with secretions.^{5,8,9}

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In this article, authors intend to describe an atypical clinical presentation of COVID-19 that involved the eyes. What makes it relevant from an epidemiological view is that conjunctivitis remained the only sign and symptom of active COVID-19. In fact, the patients never developed fever, malaise, lassitude, or respiratory symptoms. COVID 19 Infection was confirmed by RTPCR reports from the specimens taken from thenasopharyngeal swabs. Detection of RNA of SARS- CoV 2 virus by RT-PCR can be useful in its early detection and thereby taking appropriate measures for quarantine. Therefore, determining whether SARS-CoV-2 is capable of being transmitted through contact with conjunctiva is an important consideration that calls for greater exploration.

CASE DESCRIPTION AND DISCUSSION

This case is being reported after the permission was granted by the Institutional Ethical Committee.

A 36-year-old otherwise healthy doctor presented to the ophthalmology clinic in May, 2021, with one day history of conjunctival hyperemia, stinging, epiphora, watery discharge, and photophobia in her left eye. The patient showed no symptoms of fever, cough, shortness of breath, or malaise. The patient had no history of travel in the past 14 days.

The patient had contact history with her sister who had tested positive on RT- PCR for SARS-CoV-2 three weeks earlier. Given her direct contact with her sister and occupational exposure an oral and nasopharyngeal swab tests for SARS-CoV-2 were recommended. An antigen test was done on the spot which showed negative results. Upon the patient's request, an RT-PCR was done after 3 days. Results of RT-PCR from specimens of nasopharyngeal swabs were available 24-36 h later and they confirmed the infection with SARS-CoV-2 virus.

In her ophthalmic examination, the visual acuity was 6/6 for both eyes without correction. Intraocular pressure was 14 mmHg on the right and 14mmHg on the left eye. Slit-lamp examination of the left eye revealed slight eyelid edema and serous secretion with a 2+ conjunctival injection, mild chemosis, and follicular reaction in the upper and lower fornices (Figure 1).



Figure 1

The cornea was transparent. No inflammatory change were detected in the anterior chamber. Fundus examination were normal. Anterior segment as well as the posterior segment examination of the right eye was normal. Physical examination did not reveal any tenderness and/or enlargement of the submandibular, preauricular, or cervical and the surrounding lymph nodes.

Moxifloxacin eye drop QID and artificial tears without preservative QID were advised for a week. The patient started taking Tab. Doxycycline 100 mg BD for 10 days alongwith multivitamins and was instructed to self-quarantine until the complete resolution of the infection.

Although the main route of transmission of the SARS-CoV-2 is through the respiratory tract, several studies reflect over eye infection. So far, it has not been clarified whether ocular secretions are infectious. Ocular diseases caused by coronaviruses have been postulated to be rarer than adenovirus and influenza viruses. SARS-CoV-2 virus has high transmissibility and susceptibility for the people en masse which results in higher morbidity and mortalities than the common influenza virus.¹⁰ Many exceptional measures have been taken by the Governments worldwide such as nationwide lockdowns, barring of travel, strict quarantine regimes but still preventing the spread of SARS-CoV-19 has been difficult. The question arises to what extent do asymptomatic or presymptomatic individuals contribute? Though still debatable, a recent analysis showed that about 30 of infected subjects might remain asymptomatic. Though ocular surfaces have in fact great tropism for respiratory viruses, Ocular manifestation of COVID-19 and ocular transmission of SARS-CoV-2 have been often overlooked. For all healthcare providers, covering the eyes with goggles or a face shield should be considered equally important.^{10,11,12}

A study by Scalinci and Battagliola published in 2020 described five cases of patients with biomicroscopic findings of COVID-19 patients with conjunctivitis. Ocular symptoms were found to be one of the first symptom in all except one of these cases. Ocular of red eye, watery discharge, photophobia, foreign body sensation, and eyelid edema were reported. slit-lamp examination revealed serous secretion, follicular reaction in the upper and lower eyelid conjunctiva, chemosis, keratoconjunctivitis, and pseudomembranous inflammation. In four of these cases, SARS-CoV-2 viral RNA was detected in the swab samples taken from the conjunctiva and conjunctivitis remained the only sign and symptom of four active COVID-19 cases with a travel history to the Lombardy region in Italy. None of these five patients reported fever, general malaise, or respiratory symptoms, consistent with our case.¹³ As many studies have shown that SARS-CoV-2 needs ACE-2 receptors for cell invasion. With the receptors being found at different places including the cornea and conjunctiva suggesting that potential target tissue for SARS-CoV-2 lies in the ocular surfaces. It is unclear whether ocular contact with SARS-CoV-2 causes COVID-19 infection or the virus particles cause infection by draining through the respiratory tract via the nasolacrimal canal. Complications beyond keratoconjunctivitis have rarely been reported.^{5,11,13,14}

A recent report showed that one-third of eye care professionals who were involved in the diagnosis and treatment of the patients during the ongoing pandemic accidentally contracted COVID-19 and presented severe disease, including death.¹⁵ Thus, all physicians and ophthalmologists should be cautious when addressing a patient with conjunctivitis and adopt proper steps for the possible ocular transmission of SARS-CoV-2.^{5,15} The RT-PCR test for nasopharyngeal or conjunctival swabs may help in early diagnosis of the disease if patients have no symptoms other than conjunctivitis. The frequency of conjunctivitis in COVID-19 patients shows very different data of prevalence and incidence of these cases.

Table 1

Gender	Age	Clinical presentation & Symptoms	Specimen: Nasopharyngeal/oropharyngeal swabs SARS-CoV-2 REAL TIME PCR (Qualitative)		
			ORF1ab gene	Detected	Ct value 15
Female	36 years	Fever (-), cough(-), malaise (-) Chemosis (+), epiphora(+), photophobia(+)	N gene	Detected	Ct value 14
			S gene	Detected	Ct value 14

CT SCORE: <29 are strong positive reactions indicative of abundant target nucleic acid in the sample.

30–37 are positive reactions indicative of moderate amounts of target nucleic acid.

38–40 are weak reactions indicative of minimal amounts of target nucleic acid which could represent an infection state or environmental contamination.

A study in China on 1099 patients admitted for COVID-19 disease showed a prevalence of only 0.8% of conjunctivitis while there are other reports stating a prevalence of about 3% [9, 17, 18]. However, some studies for example Wu P. *et al.* [19] have stated a prevalence as high as 31.6% (95% CI, 17.5–48.7) in COVID-19 patients who were hospitalised and who presented with ocular signs and symptoms of conjunctivitis.

Limitations of this Study

A big limitations of this study is non performance of a detailed ocular examinations to exclude intraocular diseases. Due to the challenges of managing patients in this critical situation and some studies showing extremely low positive rate of SARS-CoV2 in tears and conjunctival secretions, an RT PCR of these secretions was not done. However based on the extremely low positive rate of SARS-CoV-2 RNA test by RT-PCR in tears and conjunctival secretions from patients with laboratory-confirmed SARS-CoV-2 reported from a few studies, it implies that negative test results could be false negative, not excluding the presence of the virus [19, 20, 21]. This is one of the main reasons and also due to the limited resources and access to patients with COVID-19, RT-PCR from tears and conjunctival specimen was not done.

CONCLUSION

Conjunctivitis may appear to be the only sign and symptom of COVID-19 and the patients may not have fever, fatigue, or respiratory symptoms that may cause suspicion. In these patients, acute conjunctivitis may be the only presenting sign and symptom and so to say the sole form of manifestation of COVID-19. The patients are generally report contact with COVID positive patients and therefore undergo nasopharyngeal RT-PCR tests. [16, 21]

Conjunctivitis as the only presenting manifestation of SARS-CoV2 poses an important questions for ophthalmologists worldwide hinting on the probability that manifestations of conjunctivitis could depend on the host's characteristics or the method of inoculation of the virus into the host. This suggests that the relationship between conjunctivitis and the development of serious pulmonary disease are areas yet to be explored. As a result the authors emphasize on eye protection even if patient does not show typical signs of infection. Face shields and protective eye goggles are highly advised and recommended for all health care workers irrespective of patients' clinical presentation. The relationship between eye surface infection and COVID-19 and whether the disease can be transmitted through the eye surfaces needs further research.

Patient Consent and Ethical Approval

A clearance was taken from the Institutional Ethical Committee. The patient signed written informed consent for the research use of clinical records and data included in the study with anonymity.

Conflict of Interests

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