



A Review on the Incidence of Conjunctivitis Seen in COVID-19 Disease

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Review Article

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ABSTRACT

Conjunctivitis is a pathological problem of the eye. It can be defined as an inflammatory condition consisting of membranes and conjunctiva. It can be caused by several organisms and has several possible causes. It may be caused by bacteria, viruses, fungus, or protozoa and may also occur due to infection. Conjunctivitis is a prevalent issue in developing and developed countries. In layman's language, it can also progress to red-eye very commonly and, therefore, the red disease. The treatment of conjunctivitis includes no such medications since some of them are self-healing. However, some require topical steroids to relieve the inflammation—moreover, antihistaminics, mast cell stabilizers, and NSAIDs. In bacterial conjunctivitis, antibiotics are given according to the causative organisms.

Since the virus outbreak started in India and the people of our country underwent several restrictions, including strict lockdowns, we people are bound to use electronic gadgets and online learning platforms, which has exceeded our screen time to several folds. This has increased the prevalence of different eye disorders causing refractive errors, vision loss, dry eye, eyes watering, etc. Even the toddlers who should ideally be put into a playschool and be physically active and kept away from any screen are bound to sit in front of their laptops for hours to learn something. Also, sometimes a patient may present with conjunctivitis as the only symptom. Therefore, this review article will shed light on the above sentences and discuss the severity.

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1. INTRODUCTION

An outbreak of the deadly pandemic, which started in 2019 worldwide, has made us all think about the various clinical manifestations caused by the virus. The novel virus known as Coronavirus has a range of symptoms seen in a patient suffering from the disease. Even though some of the primary symptoms seen were cough, loss of smell, and fever, there is still a list full of the complaints experienced by the patient, which requires some discussion. Conjunctivitis is one of them. Therefore, this research article throws some light on the same. Viral conjunctivitis is a common, highly contagious disease often caused by an adenovirus [1].

As we know, COVID-19 is an infectious disease that requires a lot of precautions as it spreads rapidly. It has also caused many deaths in the previous years, shattering its economy. Treatment for viral conjunctivitis is supportive [2]. One of the earliest cases of this virus in India was reported in January 2020 in a small place in Kerala, where the chief complaints were only sore throat and dry cough for a day. Other than this, the complaints can be fever, fatiguability, and chest pain progressing to pneumonia. Some patients may also have different atypical symptoms such as conjunctivitis. Simultaneous infection with two pathogens was uncommon [3].

The receptor found in the conjunctiva, named as angiotensin-converting enzyme 2 (ACE-2) receptor, also found in various tissues, including the conjunctiva, allows SARS-CoV-2 to enter host cells. At the time of 2003, SARS-associated coronavirus outbreak, research found that unprotected eye contact with secretions increased the risk of SARS infection among healthcare workers. Considering the number of patients suffering from the virus, it has been observed that the first symptom to develop was conjunctivitis. This was spread due to close contact with other previously positive patients. The early diagnosis of the viral infection in positive patients was achieved by reverse transcriptase-polymerase chain reaction (RT-PCR) detection of viral RNA, which has helped a lot since it was reliable, less time-consuming, and moderately expensive.

This review article looks upon the various ocular symptoms, including conjunctivitis, that a COVID-positive patient presents with; for the medical fraternity to overview the clinical signs and

manifestations in coronavirus disease. This study has the following limitations [4].

2. METHODOLOGY

A comprehensive literature search was performed in the Indian Journal of Ophthalmology with keywords search for 'conjunctivitis,' 'COVID-19,' 'SARS-CoV-2,' and 'ophthalmic manifestations.' Several review articles dated up to 2020 were included as references and served as the basis of this article. All the cases experiencing similar complaints were confirmed based on their nasopharyngeal or oropharyngeal swab or antibody titers. Bacteria may frequently be isolated from the conjunctiva of healthy subjects [5].

3. FINDINGS

For such cases, there is no highly effective and safe treatment regimen [6]. Lately, all the research suggests that the virus can be detected in a swab sample of conjunctiva through the RT-PCR technique's most common test done. In research of 30 positive cases, it was concluded that three out of 30, which makes 3.3% of the total patients, had only symptoms of conjunctivitis. This proves that a part of patients infected from the virus still be unknown as conjunctivitis is the sole symptom. Out of the affected patient, the sample of conjunctival swab also showed infective RNA. These samples were collected on the third and fifth days. Some other viral tests such as herpes simplex virus, adenovirus, and other viruses were also done to rule out any other illness which came out to be negative. Thus, this narrowed us to conclude that coronavirus is the only reason for conjunctivitis. The specimen can be collected from tears and secretions in the eye's conjunctiva. Ocular involvement and transmission of SARS-CoV-2 should never be overlooked [7].

Another study proved that ocular signs such as conjunctivitis-like symptoms were found in a proportionately higher percentage of individuals. Different studies have demonstrated that the specimens taken from conjunctiva are favorable for more or less 21 days, even after the virus has disappeared from the nasal swab. The continued replication of the virus is confirmed by the detection and re detection of the virus in the conjunctiva every time we take the swab for testing. The virus has been incubated in cell culture, and no cytopathic effect has been determined [8].



Fig. 1. This figure shows the upper and lower fornices with a follicular conjunctival reaction in the patient's right eye. This was seen two days before he was diagnosed positive



Fig. 2. The following picture shows a CT-Scan of the lung parenchyma, which has no evidence of pneumonia and therefore shows a better prognosis

There was a case study done on a 62-year-old male patient who had complaints of cough, weakness, fever, and the test was done on the specimen collected from his conjunctiva, and it was found out to be positive for more than 15 days even after the nasopharyngeal swab was found out to be negative. The ophthalmic history of the patient is that he was earlier diagnosed with a condition of stenosis of the nasolacrimal duct. Mild COVID-19 can cause severe bilateral conjunctivitis [9]. This gives us the idea that there was a problem in drainage of viral RNA and due to which there was a positive conjunctival swab even after a negative conjunctival swab for

weeks. In all of these cases, ocular symptoms have appeared as the first sign. Various ocular issues have been recorded, including discharge from the eye, redness, photophobia, the sensation of foreign body, and edema of eyelids. The receptors present for invasion of the cell are the primary requisite for causation of an infection by the coronavirus. The receptors are present in parts are the alveoli, the eye, the conjunctiva, and the cornea. Any virus exposure from the infected individuals transmits through the nasolacrimal duct whenever there is any virus exposure. And this results in infection. In this study, the CT Value, the cycle threshold value,

can measure the amount of viral load in a sample. It is still questionable if the covid 19 virus causes anything more dangerous other than conjunctivitis. During an experiment, when the virus was introduced into a mouse and administered in the different parts of the eyes, such as the anterior chamber, corneal, intravitreal chamber, it was found that there was a solid atopic reaction. Fibroblasts have been thought to significantly damage the retinal tissue leading to retinal pigment epithelium gliosis [9-12].

Conjunctivitis symptoms are mainly recorded in adult patients, but one case of infected youngsters has been described. Visual observations were assessed retrospectively by making phone calls with patients in two different investigations, and it was found that ocular symptoms were common in COVID-19 patients and might have clinical diagnostic values. Symptoms can appear within 2–14 days of exposure [10]. Only one of them had viral RNA found in tears, and she had conjunctivitis. None of the other 70 individuals had COVID-19 in their tears without indications of conjunctivitis. Positive RT-PCR test results in conjunctival swab samples from verified COVID-19 patients have just been published, providing objective proof for SA. The ophthalmologist's proximity to the patient increases the risk of infection [13-18].

In the ongoing pandemic, where the health workers have been working day and night continuously to cope with the uncountable cases arising every day, the ophthalmologists are also contributing their hard work. The eye care health personnel have also played a significant role. This is because the wide range of symptoms also includes eye conditions. Some patient of covid19 has developed conjunctivitis, where the ophthalmologists come into play. Since it is a very contagious disease, it can spread through various routes. The ocular secretions are one of them. These secretions and the ocular mucosa can be responsible for their spread.

Since it is in evidence to prevent the transmission, several rules are implemented in developing countries to protect the health of eyecare individuals. Several protocols have been imposed, keeping the whole pandemic in mind. The ophthalmic surgeries and treatments that are not important have been suspended, such as cataracts and other routine eye check-ups. This ensures safety and reduces the risk of transmission. As medical professionals, we must

make an informed decision and perform the more serious surgeries required. It is observed that one of the most common symptoms with which the present presents in casualty is conjunctivitis other than any ocular trauma or retinal disease. And taking into consideration the present scenario, we can suspect them as a risk of being a covid patient. This can lead to two problems. First, the patient can present with some complications, and the patient is a risk for other individuals as they have infective ocular secretions.

4. TREATMENT OF CONJUNCTIVITIS

Conjunctivitis can have different etiologies in which one of them is viral, and mostly the viral conjunctivitis is very mild and can resolve in a few days. The diagnosis of conjunctivitis is mainly clinical. The doctor can ask the patient's symptoms and history to diagnose. In a few cases, the sample of the secretions is taken for laboratory investigations. This is mainly done in severe and high-risk cases where the cause is a severe bacterial infection. The mainstay treatment is mainly symptomatic; medications that can relieve the symptoms are given. Doctors may also advise artificial tears, wiping the eye with a wet cloth, and applying warm compressions once a day. If the patient uses contact lenses, they are told to stop wearing them for a while, and also, the ones they were using before are advised to dispose of as they may have become infective. If the lens is not disposable, they have to disinfect them overnight before using them again. It is also advisable to change the lens cases [19]. Also, the patient is barred from using any cosmetic or makeup products in the eye or even around them. Most of the cases of conjunctivitis are due to viral etiology; therefore, antibiotics won't make a difference. That is why most of the patients do not require antibiotics. Also, one should keep in mind that the antibiotics, if at all, can cause worsening and decrease the effectiveness of other medications.

The typical characteristic of viral conjunctivitis is that it starts and affects one eye and gradually progresses. It is unnecessary to prescribe antiviral medications except for the herpes simplex virus because this condition is self-limiting. If the patient has developed allergic conjunctivitis, the patient may experience some irritation in the eye, for which he can be prescribed some allergy eye drops. They are antihistaminic and mast cell stabilizers that help

control the allergy. Medications that limit inflammation can also be given, such as steroids and NSAIDs.

Some treatments may also include lifestyle remedies and home remedies. These are convenient for the patient and do not require medical assistance. The first one is compression. To prepare for a compress, we need warm water and a clean cloth. The clean linen cloth is soaked and wrung in warm water and gently applied to the eyelids, but it should be closed. Generally, the compress can be both warm and cold, and it depends on the patient with which he is comfortable. A good compression helps the patient dramatically relieve the itching and is not a complex process. It has been advisable to perform a compress once or twice daily, depending on the severity. Next online is artificial tears. It is also helpful in reducing irritation in the eye. Users refrained from wearing contact lenses, leading to infection and worsening the case.

5. CONCLUSION

Therefore, I would like to conclude and say that the key to resolving this condition and controlling it medically is the early diagnosis and treatment as soon as possible. This benefits us by preventing the disease from progressing and becoming worse. It has also been shown to decrease the transmission to other individuals as they are treated early. The diagnosis is made by performing several procedures like ocular examinations and laboratory work required for the confirmation. Also, to find out the cause of the condition, whether bacterial, viral, or allergic. According to The American Academy of Ophthalmology, performing a thorough check-up and biomicroscope study is advisable. However, many of the cases are examined in the primary health care centers and emergency clinics, which do not have the facility of slit-lamp examination. It, therefore, makes the determination of the cause difficult. Segregating them into their respective causes becomes cumbersome. Antibiotics may have to be prescribed without a thorough differential diagnosis by primary or urgent care physicians. In many instances, viral etiology is misdiagnosed as bacterial conjunctivitis, leading to unnecessary antibiotic treatment.

The treatment of conjunctivitis should be acknowledged about the discomfort and the attempt to manage it in severe cases of

conjunctivitis. Corticosteroids are well-known anti-inflammatory drugs that are effective and fast-acting in reducing pain and swelling.

Finally, ocular symptoms play a significant part in COVID-19 clinical presentation. Fever, weakness, exhaustion, cough, dyspnea, diarrhea, and conjunctivitis are among the symptoms that patients may experience; nevertheless, the patient may be asymptomatic. Conjunctivitis may be the only indication or symptom of COVID-19 in some instances. Even though there is no proof that the conjunctival swab used for the RT-PCR test is positive, the nasopharyngeal swab is significantly more reliable and will aid in early diagnosis. The percentage of conjunctival swabs that are positive has been reported to be less than 5%. According to a recent survey, one-third of e-commerce users' COVID-19 disease was transmitted by most of the eye doctors, eye professionals involved in the pandemic, according to a recent survey. This suggests that there is just a little likelihood of transfer by ocular secretion. As a result, it is recommended that health personnel wear eye protection to avoid infection.

In some cases, conjunctivitis is the patient's only complaint suffering from coronavirus. Therefore, this suggests that the eye doctors and workers should take extra precautions. While no currently investigated medicinal medicines can consistently treat COVID-19, early vaccine efforts are proceeding well and showing promise. For a complete summary, a video abstract is provided.

Even though conjunctivitis is a self-limited and benign condition, it is a crucial route of viral transmission. As ophthalmologists, we must remember that prevention is the most vital component to remember.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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