Review Article

A Review On The Incidence Of Conjunctivits Seen In Covid-19 Disease

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 a number of organisms and has a number of possible causes. It may be caused by bacteria, virus, fungus or protozoa and may also occur as a result of any infection. Conjunctivitis is a very common issue in the developing as well as developed countries. It can also progress to red eye very commonly and therefore in layman language, called as the red disease. The treatment of conjunctivitis includes no such medications since some of them are self-healing. However, some do require treatment like topical steroids to aid in relieving the inflammation. Moreover, anti histaminics, mast cell stabilizers and NSAIDs. In case of bacterial conjunctivitis, antibiotics is given according to the causative organisms.

Since the virus outbreak started in India and the people of our country underwent through 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 resulted in increasing 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 should be absolutely kept away from any kind of screen are bound to sit in front of their laptops for hours to learn something. Also, sometimes it is quite possible that a patient presents with conjunctivitis as one of the or the only symptom. Therefore, this review article will throw some light in the above sentences and discuss about the severity.

Keywords: Covid-19, Conjunctivitis, antihistaminics, Dry eyes,

Introduction:

An outbreak of the deadly pandemic which started in 2019 all over the world has made us all to think about the various clinical manifestations caused by the virus. The novel virus known as Coronavirus has a range of symptoms which can be seen in a patient suffering from the disease. Even though some of the primary symptom which was seen was 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 that is often caused by an adenovirus.[1]

As we know that, COVID-19 is a communicable disease which requires great deal of precaution as it spreads rapidly. It has also caused a high number of deaths in the previous years and therefore resulted in shattering the country's economy. Treatment for viral

conjunctivitis is supportive.[2] One of the earliest case of this virus in India has been said to be 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 a variety of tissues, including the conjunctiva, allows SARS-CoV-2 to enter host cells . At the time of year 2003, SARS-associated coronavirus outbreak, research found that unprotected eye contact with secretions increased the risk of SARS infection among healthcare workers . Considering a 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 to 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.

In this review article, we look upon the various ocular symptoms, including conjunctivitis, that a COVID positive patient presents with; in order for the medical fraternity to have an overview of the clinical signs and manifestations in coronavirus disease. This study has the following limitations.[4]

Methodology:

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

Findings:

Figure 1. This is a figure showing the upper and lower fornices which has a follicular conjunctival reaction in the patient's right eye. This was seen 2 days before he was diagnosed positive.

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

Table 1. Demographics and clinical data of COVID-19 patients with conjunctivitis.

Studies	Country	F/M	Age (years)	Conjunctivitis as initial or corresponding symptom	Time and result of cPCR after COVID diagnosis (days)
Case reports					
Zhang et al.[13]	China	F	29	Corresponding	6 (+)
Chen et al.[10]	China	M	30	Corresponding	14 (+), 17 (+), 19 (−)
Cheema et al.[11]	Canada	F	29	Initial	5 (+)
Hu et al.[9]	China	NA	70	Corresponding	25 (+), 29 (+), 31 (+), 34 (+), 36 (+), 39 (−)
Colavita et al.[7]	Italy	F	65	Initial	3 (+), 9 (+), 13 (+), 16 (+), 21 (−)
Khavandi et al.[12]	Iran	M	65	Initial	NA
Salducci and *La Torre*[14]	Diamond Princess	M	72	Initial	NA
Navel et al.[20]	France	M	63	None	20 (−)
Daruich et al.[22]	Argentina	M	27	Initial	NA
Wu et al.[21]	China	M	2	Initial	NA
Ya et al.[25]	China	1/2	Range: 16–67	2 initial 1 corresponding	NA
Scalinci and *Battagliola*[15]	Italy	1/4	Range: 41–65	All initial	NA
Cohort studies					
Xia et al.[4]	China	9/21	Mean 54.5 (SD: 14.1)	1/30 initial 29/30 none	7.3 ± 3.8 [1/30 (+)]
Chen et al.[23]	China	271/263	Median 40–50	3/534 initial 25/534 corresponding	NA
Seah and *Agrawal*[8]	Singapore	6/11	Median 37 Range: 20–75	1/17 corresponding	3–20 [all patients (−)]
Hong et al.[24]	China	25/31	Mean 48.0 (SD: 12.1)	6/56 initial 9/56 corresponding	7.3 ± 3.8 [1/56 (+)]
Wu et al.[5]	China	13/25	Mean 65.8 (SD: 16.6)	1/38 initial 11/38 corresponding	NA [2/28 (+)]
Zhou et al.[6]	China	68/53	Median 48 Range: 22–89	8/121 corresponding	NA [3/121 (+)]

F: female; M: male; cPCR: conjunctival swab polymerase chain reaction; SD: standard deviation; NA: non-applicable.

Table 1. This is a table which contains the clinical data and the demographic data of patients suffering from covid as well as conjunctivitis.

For such cases, there is no highly effective and safe treatment regimen.[6]Lately all the researches done till now suggest that the presence of virus can be detected in a swab sample of conjunctiva through the most common test done which is RT-PCR technique. In research of 30 positive cases, it was concluded that 3 patients out of 30, which makes 3.3% of the total patients had an only symptom of conjunctivitis.This proves that a part of patients infected from the virus can be still unknown as the only sole symptom is conjunctivitis. Out of the affected patient, the sample of conjunctival swab also showed infective RNA. These samples were collected on the third and fifth day. Some other viral tests such as herpes simplex virus, adenovirus, and other viruses was 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 of conjunctivitis. The specimen can be collected from tears and secretions in conjunctiva of eye. Ocular involvement and transmission of SARS-CoV-2 should never be overlooked.[7]

A yet another study proved that ocular signs such as the conjunctivitis like symptoms were found in proportionately higher percentage of individuals. Different studies have demonstrated that the specimen taken from conjunctiva are found to be positive 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 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]

There was a case study done on a 62-year-old male patient who had complaints of cough, weakness, fever and the test were 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 being that he was earlier diagnosed with a condition of stenosis of 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 positive conjunctival swab even after 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 eye, redness, photophobia, sensation of foreign body, and oedema of eyelids. The receptors present for invasion of the cell is the primary requisite for causation of an infection by the coronavirus. The parts where the receptors are present are alveoli, eye, in the conjunctiva and cornea. Whenever there is any exposure of virus from the infected individuals, there is transmission of virus through the nasolacrimal duct. And this results in infection. In this study, the CT Value that is the cycle threshold value can be used to measure the amount of viral load in a sample. It is still questionable that 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 eyes such as anterior chamber, corneal, intravitreal chamber, it was found that there was strong atopic reaction. Fibroblasts have been thought to be a major part to 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. Ocular 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. Without indications of conjunctivitis, none of the

other 70 individuals had COVID-19 in their tears. 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 up with the uncountable cases arising every day, the ophthalmologists are also seen to be contributing their hard work for the same. The eye care health personnels have also played a major role. This is due to the fact that the wide range of symptoms also include eye conditions. Some patient of covid19 has developed conjunctivitis and this is where the ophthalmologists come in play. Since it is a very contagious disease it can spread through various routes. The ocular secretions is one of them. These secretions and the ocular mucosa can be responsible for its spread.

Since it is in evident to prevent the transmission there has been several rules which are implemented in the developing countries to protect the health of eyecare individuals. A number of protocols have been imposed keeping the whole pandemic in mind. The ophthalmic surgeries and treatment which are not absolutely important have been suspended such as cataract and other routine eye check-up. This ensures the safety and reduces the risk of transmission. As a medical professional it is our duty to 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 in consideration with the present scenario, we can suspect them as a risk of being a covid patient. This can lead to two problems, first that the patient can present with some complications and the patient is a risk for other individuals as they have infective ocular secretions.

TREATMENT OF CONJUNCTIVITIS:

Conjunctivitis can have different etiologies in which one of them is viral, and mostly the viral conjunctivitis is vey mild and can resolve in a few days. The diagnosis of conjunctivitis is mainly clinical. The doctor can ask the symptom from the patient and history to come to the diagnosis. In few cases, the sample of the secretions are taken for laboratory investigations. This is mainly done in severe cases and high-risk cases where the cause is an extreme bacterial infection. The mainstay treatment is mainly symptomatic, medications which can relieve the symptoms are given. Doctors may also advise use of artificial tears, wiping of the eye with wet cloth, and to apply warm compressions once a day. If the patient uses contact lenses, then they are told to stop wearing them for a while and also the ones which they were using before are advised to dispose off as it may have become infective. In case the lens is not disposable they have to disinfect them for at least overnight before using them again. It is also advisable to change the lens cases Also, the patient absolutely 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 aetiology therefore the use of 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 later gradually progresses to the other eye. It is not necessary to prescribe antiviral medications

except for when it is herpes simplex virus, because this condition is self-limiting. If the patient has developed allergic conjunctivitis, it is possible that the patient will experience some irritation in the eye for which he can be prescribed some allergic eye drops. They are antihistaminic and mast cell stabilisers which help in the control of the allergy. Medications which 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 being compression. To prepare for a compress all we need is a warm water and a clean cloth. The clean linen cloth is soaked and wringed in warm water and gently applied in 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 as it greatly relieves the itching and is not a complex process. It has been advisable to perform compress once or twice daily depending on the severity. Next on line is artificial teardrops. It is also helpful in reducing irritation in the eye. Contact lenses users are refrained from wearing them as it can lead to infection and worsening of the case.

CONCLUSION:

Therefore, I would like to conclude and say that the key to resolve this condition and control it medically is the early diagnosis and treatment as soon as possible. This benefits us by preventing the disease to progress and become more worse. It has also shown to decrease the transmission to other individuals as they are treated early. The diagnosis is done by performing several procedures like ocular examinations and also at times various laboratory work required for the confirmation. Also, to find out the cause of the condition whether it is bacterial, viral or allergic. According to The American Academy of Ophthalmology, it is advisable to perform a thorough check up using slit lamp bio microscopy study.However, many of the cases are examined in primary health care centre 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 as many as half of instances, viral etiologies are misdiagnosed as bacterial conjunctivitis, leading in 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, diarrhoea, 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 certain cases. Despite the fact that 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 in order to avoid infection.

In some cases, conjunctivitis is the only complaint of the patient suffering from coronavirus. Therefore, this suggests that the eye doctors and workers should take extra precaution. While

there are no currently investigated medicinal medicines that can consistently treat COVID-19, early vaccine efforts are proceeding well and show promise. For a more complete summary, a video abstract is provided. [

Despite the fact that conjunctivitis is a self-limited and benign condition, it is a key route of viral transmission. As ophthalmologists, we must remember that prevention is the most important component to remember.

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