OCULAR MANIFESTATION OF COVID-19: A REVIEW

ABSTRACT:

In December month of 2019, a few pneumonia cases of mysterious origin were discovered in a city in China. Later it was found to be coronavirus which caused mild to moderate upper respiratory tract infections in patients. WHO designated it a pandemic in March 2020. The virus belongs to the coronaviridae family. The clinical symptoms that are seen in covid-19 are fever, cough, fatigue, shortness of breath, etc. ocular manifestations of covid are rare, but some of them include dryness of the eye, pain, discharge, itching, etc. the most common and essential manifestation is conjunctivitis. It is spread through droplets. Proper protection and hygiene can minimize the spread of this infection.

Other than the very much known respiratory illnesses such as cough, cold, loss of taste, smell, etc., the covid 19 was also seen to have some ocular manifestations. Studies showed 1 out of 10 patients to have some visual change during the illness period. The most common ocular manifestation is that of conjunctivitis. Although, conjunctivitis must be differentiated from other causes of eye redness. There are many different kinds of conjunctivitis of different etiologies; it is essential to know the exact etiological factor for providing the patient with definitive treatment. As covid is very contagious, ocular examination and management are also challenging since it can spread from the doctor to the ophthalmologist attending them. So, prevention is possible to deal with this ongoing pandemic and its ophthalmic complications.

KEYWORDS: Covid-19, Ocular Manifestation, Conjunctivitis, Management

INTRODUCTION:

In the last month of 2019, pneumonia caused by severe acute respiratory syndrome coronavirus (SARS-CoV-2) infections was discovered in a city in Hubei Province of China.[1] On February 11, 2020, the World Health Organization (WHO) designated the sickness due to SARS-CoV infection as coronavirus disease 2019. (COVID-19).[1] SARS-CoV-2 is highly contagious, and most people in the general community are at risk of infection.[1]

Coronaviruses are a group organism with single-stranded genetic material that is ribonucleotides viruses that are enclosed and have various properties. They are currently divided into three antigenic categories: mammalian coronaviruses are in groups 1 and 2, while avian coronaviruses are in group 3. Coronaviruses that affect humans are linked to common cold-like illnesses and are divided into two groups: group 1 (CoV-229E) and group 2 (CoV-229E) (CoV-OC43). According to sequence analysis, the complete genetic material of coronaviruses revealed a genetic molecule of around 29,750 base length, with a genomic organization comparable to that of other coronaviruses.

They cause a wide range of disorders in people and animals, including those that impact the respiratory, gastrointestinal, hepatic, and nervous systems.[2] Covid had an average incubation time of 5.2 days., according to a study of early transmission dynamics.[3] Two other coronavirus epidemics have been recorded in recent decades. SARS and MERS, for example, are pulmonary infectious illnesses that pose a severe threat to public health. This new covid-19 infection revealed the interhuman spread of SARS-CoV-2 among doctors and nurses in a Wuhan hospital. SARS-global CoV-2's spread and lethality pose significant problems among the worldwide medical system. SARS-CoV-2 is highly contagious, while COVID-19 has an incubation period of 1 to 14 days, according to reports.[4-5]

Ocular discomfort, redness, discharge, and follicular conjunctivitis were the most commonly reported ocular manifestations of COVID-19. In a tiny number of patients, viral RNA was found in their conjunctival/ tear samples. There is a lot of publication bias and heterogeneity in the research that is available. Prospective studies with meticulous data collection and reporting must assess COVID-19 ocular involvement.[6]

To keep epidemics in the community and hospitals under control, COVID-19 must be discovered fast and reliably. The real-time RT-PCR (RRT-PCR) is the most reliable test. Other tests include reverse transcription-polymerase chain reaction (RT-PCR) and reverse transcription loop-mediated isothermal amplification (RT-LAMP). All these are current coronavirus diagnostic assays.[3]

The risk factors for the severe disease have been identified as advanced age, cardiovascular disease, diabetes, hypertension, and malignancy. A patient with suspected COVID-19, a fever lasting more than five days, along with tachypnoea, tachycardia, or hypotension, requires immediate medical treatment and hospitalization.

While some drugs have shown in vitro efficacy against the coronavirus that causes the severe acute respiratory syndrome, clinical evidence is inadequate to encourage or discourage their use. In the absence of further clinical trials, hydroxychloroquine and lopinavir may be

recommended for individuals with severe coronavirus infection among the currently available medications.[7]

Ophthalmologists are at a high risk of getting infected as they are close to the patient. It is challenging for ophthalmologists to examine the patient without getting infected. Proper personal protective equipment and masks are essential for the protection of the ophthalmologist.

OBJECTIVE:

There are significantly fewer types of ocular manifestation of covid-19, but studies have shown 1 out of every ten covid positive patients complain of some visual discomfort or changes during the illness period. Some ocular manifestation is being ignored due to their low prevalence. As a reviewer, I have tried to know the types of ocular manifestation related to covid and their prevalence.

METHODOLOGY:

Literature exploration was performed in Google Scholar, PubMed using keywords says-CoV-2', 'ophthalmology,' 'ophthalmic manifestations,'' COVID-19', 'clinical manifestation,' we have tried to incorporate the distinctive, pertinent, and significant articles.

COVID-19 PANDEMIC:

In December 2019, a chain of severe atypical respiratory illness cases was reported in China. This swiftly swept throughout China, starting in Wuhan. It didn't take much time to figure out that a new coronavirus was blamed. The new coronavirus was called a severe acute respiratory syndrome because of its strong resemblance to SARS-CoV, which led to acute respiratory distress syndrome (ARDS) and a high death rate at the start of the 21st century. (SARS-CoV-2, 2019-nCoV). The animal transmission associated with a seafood market in Wuhan, China, has initiated the SARS-CoV-2 outbreak. Interhuman spread was eventually determined to have played a key role in the outbreak that followed. This virus caused Coronavirus Disease, labeled a pandemic by the World Health Organization (WHO). COVID-19 has infected a large number of individuals all across the world, with cases reported in more than 190 countries and territories. As of April 2020, approximately 1,500,000 incidents had been reported worldwide, according to John Hopkins University's Center for Systems Science and Engineering (CSSE).[8] When the general public wants quick information during catastrophic disease outbreaks, studies have indicated that a section of the community at a higher risk of suffering fear, stigmatization, and prejudice will demand particular attention from public health experts. Many NGOs and other social services groups forward for the support o these people, and many mental health groups also may forward for the help of those who were needful.

CLINICAL MANIFESTATION:

Fever, cough, weariness, shortness of breath, and muscle stiffness are common signs of SARS-CoV-2 infection. Sputum production, running nose, chest pain, sore throat, nausea, vomiting, diarrhea, headache, loss of taste, and loss of smell may develop a few days before the fever, demonstrating that fever is an essential but not the only early indicator of infection. Several patients recorded only a slight fever, weariness, or no symptoms. The immune system, respiratory system, cardiovascular function, and coagulation are all affected by physiological

changes during pregnancy. These might influence the course of COVID-19 illness in either a good or negative way. Covid affects the growth of the embryo, labor, and neonatal growth. Infected mothers cannot feed their babies also, and since breast milk is the first protection of the baby, its deficiency can cause a severe impact on the growth of the babies.

COVID-19 NEUROLOGICAL IMPACT:

The presence of coronaviruses, such as SARS-CoV-2, is not just limited to the respiratory tract; they commonly enter the CNS, and findings suggest that severe systemic comorbidities, including acute neurologic disease, are related to the new viral infection and contribute to substantial outcome disparities. Before presenting signs of fever or cough, COVID-19 patients may have non-specific neurological symptoms such as delirium. Older adults suffering from delirium are especially vulnerable. Delirious patients are more prone than non-delirious patients to use more hospital staff time and valuable life-support resources, remain more extended, and develop in-hospital problems. Policies that promote seclusion and immobility for hospitalized patients, paired with acute illness, create a high-risk setting for delirium while being designed to reduce contagion. [12] other than this, depression and anxiety are also significant issues that should be looked after as a large popular is affected by it.

CORONAVIRUS:

The coronavirus was known to have two different strains, one was known to cause respiratory manifestations, and the other was a diarrheagenic strain. Many patients during the second wave were seen to have diarrhea as a significant symptom.

Over 80% of SARS-CoV-2 infections appear as mild respiratory diseases that may easily be treated with outpatient therapy in ambulatory patients. About 15% of patients require inpatient treatment for moderate to severe pneumonia. In hospitalized patients, the center time from the commencement of symptoms to the appearance of breathlessness is five days, and the median time spent in the hospital is five days. The disease can quickly go to multiple organ failure and possibly death in critically unwell patients. Complications such as hypoxemic respiratory failure or hypotension may necessitate patient entrance to an intensive care unit. Approx mortality rate seems to be approximately 3.8%.[9] other than fatal conditions, people also have encountered condition that has changed their life a lot.

OCULAR MANIFESTATION:

According to a study, nearly one out of every 10 COVID-19 patients had at least one visual sign. Even though these signs are not familiar, physicians and ophthalmologists should be aware of them.[10]

The presence of the ACE2 receptor, a coronavirus, and SARS-CoV-2 cell receptor, in eye cells could be the source of ocular symptoms in people infected with COVID-19 and other coronaviruses. SARS-CoV-2 can be spread through tears, and infection droplets can enter the body through the eye. As a result, eye protection is critical for everyone, particularly healthcare personnel, to protect themselves from SARS-CoV-2.[10]

Dryness of the eye or sensation of foreign body, rubor, tears, itching, pain in eye, and discharges were the most common ocular signs in COVID-19 patients. The cause of dry eye or sensation of

foreign bodies in coronavirus infected individuals is unknown; it may or may not be related to coronavirus. During the COVID-19 outbreak, dryness in the eye could have been induced by wearing face masks and the expiratory air stream into the eyes, mainly if the masks were loose against the nose and face. The increased tear evaporation caused by the jet of air against the ocular surface might produce dry eye symptoms. Furthermore, since the outbreak, people have spent more time watching screens, worsening dry eye symptoms. The rate and severity of blinks are dramatically reduced while watching a screen, worsening dry eye symptoms.[10]

The most frequent eye condition among patients was conjunctivitis. Viruses like Haemophilus influenza, etc. bacteria like Staphylococcal species, Neisseria gonorrhoeae, and allergens like pollen can all cause conjunctivitis. Coronavirus and SARS-CoV-2 both have the potential to cause conjunctivitis. Conjunctivitis was linked to corneal subepithelial infiltrations, corneal epithelial abnormalities, painful preauricular lymphadenopathy, and conjunctival follicular response in a study of COVID-19 patients in Canada. They found that sticky secretions gathered around the eyelashes irritated the eyelids, and they identified mucous filaments, tarsal pseudomembranous, and superficial punctuate keratitis as a result.[10]

Ophthalmologists should keep in mind that coronavirus is a possible analysis when detecting visual symptoms and conjunctivitis during the phase of pandemic, especially when other coronaviruses like respiratory indications or fever are present. COVID-19 systemic symptoms such as fever and cough may start hours or days before ocular symptoms appear.[10]

DIFFERENTIAL DIAGNOSIS OF OCULAR MANIFESTATION

Conjunctivitis, which is otherwise indistinguishable from other viral etiologies, has been the most common ocular symptom of COVID-19. Conjunctivitis, too, can be of a wide range of varieties depending upon etiology viz infective, allergic, toxic, etc. Various tests need to be run to know the exact type of conjunctivitis the patient is suffering from for definitive treatment. A wide range of typical ocular signs of eye redness and excessive weeping are included in differential diagnosis: conjunctivitis due to bacteria, conjunctivitis due to allergen, and another viral conjunctivitis (e.g., adenovirus), Keratitis caused by the herpes simplex virus, Corneal abrasion, Foreign body, Anterior uveitis Dry eye syndrome is a condition that affects the eyes. Chemosis in a critically ill patient, exposure keratopathy in an intubated patient.[11]

PREVENTION STRATEGIES

Disease prevention techniques are critical for preventing disease spread. According to the data, 1 out of every ten covid-19 patients had some ophthalmic discomfort; it becomes a warning sign already to focus on the prevention part as soon as a patient has texted positive. Various ophthalmology camps are set up in rural areas as the rural population faces the problem of visiting a doctor due to a lack of resources. The camps thereby make their lives easier, eventually minimizing the overall cases. Patients should use behavioral modifications to avoid direct contact of the eyes and face, Aside from physical distance and proper hand-washing hygiene.[11]

MANAGEMENT OF OCULAR MANIFESTATION

COVID-19 conjunctivitis, like other viral infections, is thought to be self-limiting and treatable with suggestive treatment. It is very significant for ophthalmologists to refer to, appreciate the manifestations of covid-19 that concern the eye. According to the data, 1 out of every ten covid-

19 patients had some ophthalmic discomfort; it becomes a warning sign to focus on the management as soon as a patient complains of even slight discomfort in the eye. A huge lack of awareness about the same still exists that eventually leads to a lack of management and further undesirable consequences. Early diagnosis is essential for a better prognosis. Regular screening of patients even after complete recovery from covid-19 is essential for decreasing the number of victimized patients. In the nonexistence of considerable eye irritation, reduced vision, or compassion, many people can be treated distantly with a trial of regular preservative-free artificial tears, cold compresses, and lubricating ophthalmic ointment. A short course of topical antibiotics, as per the patient's symptoms and risk factors, can prevent or cure bacterial superinfection.[11-20]

COVID AN OPHTHALMOLOGIST:

During patient consultations, ophthalmologists rely heavily on physical examination. The closeness between the patient and the ophthalmologist during the slit lamp microscope investigation is relevant. Droplets from a cough or sneeze have been observed to travel up to 6 meters, a span that includes the distance between the patient and the ophthalmologist.

Clinical findings during the SARS-CoV epidemic revealed tears as an infection route. With the help of some diagnostic tools like RT-PCR reverse polymerase chain reaction, the viral RNA of covid can be detected in the patient’s tears. While such tales are subjective, they emphasize the potential of the tear to cause infection, a liquid with which ophthalmologists and tools get in touch regularly. If this is the case, more research into disinfection and personal protective equipment (PPE) practices for ophthalmology clinics is urgently needed.

Prevention strategies can be advantageous to check patients based on created observation case definitions, which is especially relevant to ophthalmic practice. In 2003, the World Health Organization (WHO) introduced a case categorization system that divided patients into three groups: general, suspect, and probable. In Hong Kong, a country hard struck by SARS, ophthalmologists advised wearing complete PPE in all instances, regardless of SARS status. While the transmission mechanism is being determined, emphasis on hand cleanliness and stockpiling PPE such as N95 face cover, hand covers, gowns, and glasses should be considered.

CONCLUSION:

This literature review is written to know for the readers the ocular manifestations that are associated with covid-19. Since only a few symptoms are associated with covid-19, it is very much neglected. Severe conjunctivitis can be caused by covid-19 which can be avoided with essential protection and hygiene. It is spread through droplets, and ophthalmologist are in very close proximity with the patients, so they are at a very high risk of getting it. Proper protection for the ophthalmologist is very important to avoid getting infected. Along with the significant symptoms that are associated with covid, the other diseases that are becoming a severe threat with time should not be ignored. Early detection and treatment are critical instruments in managing any disease that poses a hazard to humanity. Other complications include body ache, fatigue, sore throat, difficulty in breathing, cough, etc.

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