OCULAR MANIFESTATION OF COVID-19: A REVIEW

ABSTRACT:

In the December month of 2019, few case of pneumonia of mysterious orign was discovered in a city of 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 in seen in covid-19 are fever, cough, fatigue, shortness of breath, etc. ocular manifestation of covid are rare, but some of them include dryness of eye, pain, discharge, itching, etc. the most common and important 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, loss of smell etc, the covid 19 was seen to have some ocular manifestations also. Studies showed 1 out of 10 patients to have some kind of visual change during the illness period. The most common ocular manifestation is that of conjunctivitis. Although, the conjunctivitis must be differentiated from other causes of eye redness. There also exists many different kinds of conjunctivitis of different etiologies, it is very important to know the exact etilogical factor for providing the patient with a definitive treatment. As covid is very contagious, ocular examination and management is also very difficult since it can spread from the doctor to the ophthalmologist attending them. So, prevention is the way 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 as a result of 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 that have single-stranded genetic material that is ribonucleotides viruses that are enclosed and have a variety of 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 effect human are linked to common cold-like illnesses and are divided into two groups: group 1 (CoV-229E) and group 2 (CoV-229E) (CoV-OC43). The full genetic material of coronaviruses revealed an genetic molecule of around 29,750 base length, with a genomic organisation comparable to that of further coronaviruses, according to sequence analysis.

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 serious threat to public health. In a Wuhan hospital, this new covid-19 infection revealed interhuman spread of SARS-CoV-2 among doctors and nurses. SARS-global CoV-2's spread and lethality pose major problems among the worldwide medical system. SARS-CoV-2 is highly communicable, 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 are available. Prospective studies with meticulous data collecting and reporting are required to assess COVID-19 ocular involvement.[6]

In order 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 loopmediated isothermal amplification (RTLAMP). All these are current coronavirus diagnostic assays.[3]

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

While some drugs have shown in vitro efficacy against the coronavirus that causes 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 very risk of getting infected as they are at a very close proximity with the patient. It is really difficult for the ophthalmologists to examine the patient without actually getting infected. Proper personal protective equipment and masks are very important for the protection of the ophthalmologist.

OBJECTIVE:

There are very less types of ocular manifestation of covid-19 but studies have shown 1 out of every 10 covid positive patients complain of some type of visual discomfort or changes during the illness period.There are some ocular manifestation which are being ignored due to its low prevalence. As a reviewer, I have tried to know the types ocular manifestation that are related to covid and their prevalance.

METHODOLGY:

Literature exploration was performed in GoogleScholar, PubMed using keywords'SARS-CoV-2','ophthalmology','ophthalmicmanifestations','COVID-19',‘clinical manifestation’, we have tried to incorporate the distinctve, pertinent and significant articles.

COVID-19 PANDEMIC:

In Dec 2019, a chain of severe atypical respiratory illness cases were 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 to blame. The new coronavirus was called severe acute respiratory syndrome coronavirus because to its strong resemblance to SARS-CoV, which led to acute respiratory distress syndrome (ARDS) and high death rate in the start of 21st century. (SARS-CoV-2, 2019-nCoV). The A animal transmission associated to a market of seafood in Wuhan, China, is suspected to have 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, which was labelled 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] During catastrophic disease outbreaks, when the general public wants quick information, studies have indicated that a section of the community that is at a higher risk of suffering fear, stigmatisation, and prejudice will demand particular attention from public health experts. Many NGOs as other social services group forward for the support o these people and many mental health group also may forward for the help of those who were needful.

CLINICAL MANIFESTATION:

Fever, cough, weariness, shortness of breath, and muscle stiffness are all common signs of SARS-CoV-2 infection. Sputum production, running nose, chest pain, sore throat, nausea, vomiting, diarrhoea, headache, loss of taste, and loss of smell may develop a few days before fever, demonstrating that fever is an essential but not the only early indicator of infection. Only a slight fever, weariness, or no symptoms were recorded by several patients. The immune system, respiratory system, cardiovascular function, and coagulation are all affected by physiological changes that occur during pregnancy. These might influence the course of COVID-19 illness in

either a favourable or negative way. Covid affect the growth of embryo, labour 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 severe imfact 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 with the new viral infection and contribute to substantial outcome disparities. Some Before presenting signs of fever or cough, COVID-19 patients may have non-specific neurological symptoms such as delirium. Elderly people 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 longer, and develop in-hospital problems. Policies that promote seclusion and immobility for hospitalised 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 is also some major issue which should be looked after as a large popular are affect by it.

CORONAVIRUS:

The coronavirus was known to have 2 different strains,one was known to cause respiratory manifestations and the other one was a diarrheogenic strain. Many patients during the second wave were seen to have diarrhea as a major symptom.

In ambulatory patients, over 80% of SARS-CoV-2 infections appear as a mild respiratory disease that may easily be treated with outpatient therapy. For moderate to severe pneumonia, about 15% of patients require inpatient treatment. In hospitalised patients, the center time from the commencement of symptom to the appearance of breathlessness is five days, and the median time spent in the hospital is five days. In critically unwell patients, the disease can quickly go to multiple organ failure and possibly death. 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 have also incountered 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. Despite the fact that these signs are not common, 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 themselve from SARS-CoV-2.[10]

Dryness of 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 eye could have been induced by wearing of face masks and the expiratory air stream into the eyes, particularly if the masks were loose against the nose and face. The increased evaporation of the tear 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, which may worsen 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 as a possible analysis when detecting visual symptoms and conjunctivitis during the phase of pandemic, especially when other coronavirus 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]

DIFFERTIAL 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 varities depending upon etiology viz infective, allergic, toxic etc. Various tests need to be run to know the exact type of conjunctivitis that the patient is suffering with for giving a definitive treatment. A wide range of typical ocular signs of eye redness and excessive weeping are included in differential diagnosis: conjunctivitis due bacteria, conjunctivitis due to allergen, and other 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. As according to the data, 1 out of every 10 covid-19 patients had some kind of 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 lack of resources. The camps thereby make their life easier which eventually minimizes the overall cases. Patients should use behavioural 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, appreciate the

manifestations of covid-19 that concern the eye. As according to the data, 1 out of every 10 covid-19 patients had some kind of ophthalmic discomfort, it becomes a warning sign already to focus on the management as soon as a patient complains of even slight discomfort in the eye. Their still exists a huge lack of awareness about the same that eventually leads to lack of management and further undesirable consequences. Early diagnosis is very important for a better prognosis. Regular screening of patients even after absolute recovery from covid-19 is very important for decreasing the number of victimized patients. In the nonexistence of considerable eye irritation, reduced vision, or compassion to, a lot of people can be treat 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 need of the patient's symptoms and risk factors, can prevent or cure bacterial superinfection.[11-20]

COVID IN 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 of special relevance. Droplets from a cough or sneeze have been observed to travel up to 6 metres, a span that clearly includes the distance between the patient and the ophthalmologist.

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

Prevention strategies, It 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 mechanism of transmission is being determined, an 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 there are only a few symptoms that are associated with covid-19, it is very much neglected. Serious conjunctivitis can be caused by covid-19 which can be avoided with basic protection and hygiene. Its is spread through droplets and ophthalmologist are in very close approximitry with the patients so they are at a very high risk of getting it. Proper protection for the ophthalmologist are very important to avoid getting infected. Along with the major symptoms that are associated with covid, the other diseases that are becoming a serious threat with time should not be ignored. Early detection and treatment are both critical instruments in the management of any disease that poses a hazard to humanity. Other complications include body ache, fatigue, sore throat, difficulty in breathing, cough etc.

REFERENCES:

1. Shi, Y., Wang, G., Cai, Xp. *et al.* An overview of COVID-19. *J. Zhejiang Univ. Sci. B* **21,** 343–360 (2020).
2. He F, Deng Y, Li W. Coronavirus disease 2019: What we know?. Journal of medical virology. 2020 Jul;92(7):719-25.
3. Zhai P, Ding Y, Wu X, Long J, Zhong Y, Li Y. The epidemiology, diagnosis and treatment of COVID-19. International journal of antimicrobial agents. 2020 May 1;55(5):105955.
4. Vicenzi E, Canducci F, Pinna D, Mancini N, Carletti S, Lazzarin A, Bordignon C, Poli G, Clementi M. Coronaviridae and SARS-associated coronavirus strain HSR1. Emerging infectious diseases. 2004 Mar;10(3):413.
5. Tsai PH, Lai WY, Lin YY, Luo YH, Lin YT, Chen HK, Chen YM, Lai YC, Kuo LC, Chen SD, Chang KJ. Clinical manifestation and disease progression in COVID-19 infection. Journal of the Chinese Medical Association. 2021 Jan 1;84(1):3-8.
6. Nasiri N, Sharifi H, Bazrafshan A, Noori A, Karamouzian M, Sharifi A. Ocular manifestations of COVID-19: A systematic review and meta-analysis. Journal of ophthalmic & vision research. 2021 Jan;16(1):103.
7. Varghese GM, John R, Manesh A, Karthik R, Abraham OC. Clinical management of COVID-19. The Indian Journal of Medical Research. 2020 May;151(5):401.
8. Yuki K, Fujiogi M, Koutsogiannaki S. COVID-19 pathophysiology: A review. Clinical immunology. 2020 Jun 1;215:108427.
9. Tsai PH, Lai WY, Lin YY, Luo YH, Lin YT, Chen HK, Chen YM, Lai YC, Kuo LC, Chen SD, Chang KJ. Clinical manifestation and disease progression in COVID-19 infection. Journal of the Chinese Medical Association. 2021 Jan 1;84(1):3-8.
10. Nasiri N, Sharifi H, Bazrafshan A, Noori A, Karamouzian M, Sharifi A. Ocular manifestations of COVID-19: A systematic review and meta-analysis. Journal of ophthalmic & vision research. 2021 Jan;16(1):103.
11. Hu K, Patel J, Swiston C, Patel BC. Ophthalmic manifestations of coronavirus (COVID-19). StatPearls [Internet]. 2021 Feb 26.
12. Cipriani G, Danti S, Nuti A, Carlesi C, Lucetti C, Di Fiorino M. A complication of coronavirus disease 2019: delirium. Acta Neurologica Belgica. 2020 Aug;120(4):927-32.
13. Acharya, Sourya, Samarth Shukla, and Neema Acharya. “Gospels of a Pandemic- A Metaphysical Commentary on the Current COVID-19 Crisis.” JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH 14, no. 6 (June 2020): OA01–2. https://doi.org/10.7860/JCDR/2020/44627.13774.
14. Arora, Devamsh, Muskan Sharma, Sourya Acharya, Samarth Shukla, and Neema Acharya. “India in ‘Flattening the Curve’ of COVID-19 Pandemic - Triumphs and Challenges Thereof.” JOURNAL OF EVOLUTION OF MEDICAL AND DENTAL SCIENCES-JEMDS 9, no. 43 (October 26, 2020): 3252–55. https://doi.org/10.14260/jemds/2020/713.
15. Bawiskar, Nipun, Amol Andhale, Vidyashree Hulkoti, Sourya Acharya, and Samarth Shukla. “Haematological Manifestations of Covid-19 and Emerging

Immunohaematological Therapeutic Strategies." JOURNAL OF EVOLUTION OF MEDICAL AND DENTAL SCIENCES-JEMDS 9, no. 46 (November 16, 2020): 3489–94. https://doi.org/10.14260/jemds/2020/763.

16. Burhani, Tasneem Sajjad, and Waqar M. Naqvi. "Telehealth - A Boon in the Time of COVID 19 Outbreak." JOURNAL OF EVOLUTION OF MEDICAL AND DENTAL SCIENCES-JEMDS 9, no. 29 (July 20, 2020): 2081–84. https://doi.org/10.14260/jemds/2020/454.
17. Butola, Lata Kanyal, Ranjit Ambad, Prakash Keshaorao Kute, Roshan Kumar Jha, and Amol Dattaroa Shinde. "The Pandemic of 21st Century - COVID-19." JOURNAL OF EVOLUTION OF MEDICAL AND DENTAL SCIENCES-JEMDS 9, no. 39 (September 28, 2020): 2913–18. https://doi.org/10.14260/jemds/2020/637.
18. Dasari, Venkatesh, and Kiran Dasari. "Nutraceuticals to Support Immunity: COVID-19 Pandemic- A Wake-up Call." JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH 14, no. 7 (July 2020): OE05–9. https://doi.org/10.7860/JCDR/2020/44898.13843.
19. Dhok, Archana, Lata Kanyal Butola, Ashish Anjankar, Amol Datta Rao Shinde, Prakash Kesharao Kute, and Roshan Kumar Jha. "Role of Vitamins and Minerals in Improving Immunity during Covid-19 Pandemic - A Review." JOURNAL OF EVOLUTION OF MEDICAL AND DENTAL SCIENCES-JEMDS 9, no. 32 (August 10, 2020): 2296–2300. https://doi.org/10.14260/jemds/2020/497.
20. Gawai, Jaya Pranoykumar, Seema Singh, Vaishali Deoraoji Taksande, Tessy Sebastian, Pooja Kasturkar, and Ruchira Shrikant Ankar. "Critical Review on Impact of COVID 19 and Mental Health." JOURNAL OF EVOLUTION OF MEDICAL AND DENTAL SCIENCES-JEMDS 9, no. 30 (July 27, 2020): 2158–63. https://doi.org/10.14260/jemds/2020/470.