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Acute Anterior Uveitis (Ocular Manifestation of COVID-19): A Case Report

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ABSTRACT

A 55 years old female presented in an eye clinic of Lahore, Pakistan with redness, dull ache and mild blurring of vision in her left eye for 2 days. On examination, her best corrected visual acuity was 6/6 partial in right eye and 6/9 partial in left eye. Slit lamp examination revealed bilateral follicular conjunctivitis and circum-corneal congestion of the left eye with mild flare and +2 cells in anterior chamber. Fundus examination was normal on both sides. Prednisolone eye drops were suggested six times a day and patient was called after two days. On follow up visit, circum-corneal congestion was reduced and cells in anterior chamber were +1. The patient had moderate fever with mild respiratory symptoms. COVID RT- PCR was done which came out positive. The patient was isolated. Topical steroids were tapered over two weeks and telephonic follow-up was continued. Systemic and ocular symptoms improved over a period of two weeks without any sequelae.

Key words: Uveitis, COVID 19, Conjunctivitis

INTRODUCTION

It is about nine months since the start of COVID-19, a deadly pandemic, which is caused by a new strain of Corona virus. Wuhan city of China was the first to experience this deadly disease. Diseases known to be caused by Coronavirus until now include severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS). Although MERS-CoV and SARS-CoV have caused different systemic features, ocular signs and symptoms were not reported.[1] However, we find conjunctivitis as an ocular manifestation of COVID-19 as reported in literature.

Whether this disease started from bats or not is as yet unconfirmed but so far the reported sources of spread are from person to person via direct contact, droplets and mucous membranes especially mouth, eyes and nose.

COVID 19 is caused by Beta coronavirus (RNA virus) from Coronaviridae family. Beta coronavirus is a single-stranded virus which is enveloped. It has close relation with coronavirus responsible for severe acute respiratory syndrome.[2] This led to its name as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). More than 100 strains of this virus have been recognized. Angiotensin-converting enzyme 2 receptor (ACE2) is the main target through which the virus enters into the tissues.[3] Research shows that ACE2 receptors are present in ocular tissues including conjunctiva and cornea. However, receptor density in these tissues is quite low.

This case is reported to add up to the existing knowledge about the ocular manifestations of constantly evolving COVID-19.

CASE REPORT

A 55 years old female presented in a private clinic of Lahore with redness, dull ache and mild blurring of vision in her left eye for 2 days. There was a sudden onset of these symptoms. The patient was non-diabetic, non-hypertensive and there was no history of any other systemic disease, trauma or drug intake. Family history was unremarkable. Patient did not have any contact with a person who was a traveler or who had acquired COVID-19 during the last two weeks. However, she denied taking precautionary measure while going markets. On examination, her best-corrected visual acuity was 6/6 partial in right eye and 6/9 partial in left eye. Intra ocular pressures were normal on digital Tonometry. Slit lamp examination revealed bilateral follicular conjunctivitis and circum-corneal congestion of the left eye with mild flare and +2 cells in anterior chamber. Cornea and lens were clear. Fundus examination was normal on both sides. Prednisolone eye drops were started six times a day and patient was called after two days. On

follow up visit, circum-corneal congestion was reduced and cells in anterior chamber were +1. Visual acuity was improved to 6/9. However, the patient had moderate fever with mild respiratory symptoms and loss of sense of smell. Complete blood examination showed normal picture but COVID RT-PCR of the naso-pharyngeal swab was positive. The patient was referred to physician who suggested isolation at home. As anterior uveitis was improving, topical steroids were tapered over two weeks and telephonic follow-up was assured. Systemic and ocular symptoms improved over a period of two weeks without any sequelae.

Fig-1: Left circum-corneal congestion caused by iritis.

Fig-2: A closer view of the left eye

DISCUSSION

Patients with COVID-19 present with muscle aches or weakness, cough, headache, loss of smell or taste and fever. Although ocular symptoms are not very common but in a survey of non-hospitalized patients, 47% of the COVID-19–positive patients reported at least one ocular symptom. These included pain, photophobia, flashes or floaters, blurry vision and red eyes. In 20.6% cases, ocular symptoms were reported before systemic illness and most of the patients had persistent ocular complaints even after systemic recovery.[4] This particular patient also presented with anterior uveitis before she had systemic symptoms.

Earlier to this case report, a case of bilateral anterior uveitis was reported by Bettach et al.[5] The patient had bilateral anterior uveitis, IOP of 12mm Hg and fundus examination revealed clear vitreous and a small focal intra-retinal hemorrhage in the left fovea. Fundus examination in our patient was normal. Although there is no way to prove that uveitis in these patients was a direct effect of COVID 19 but in Kawasaki disease, which is a multi-system organ disease, uveitis has been quite frequently seen. Similar mechanism of Iritis can be hypothesized to involve uveal tissue in COVID 19.

Entry of Corona virus into the eye can be through direct hand to eye contact or by droplet infections or it may enter the eyes as a consequence of systemic disease. Once into the eye, virus gains entry into the ocular tissues through ACE2 receptors, found in the conjunctiva and cornea. Whether iritis is caused by direct virus entry into the anterior chamber through cornea (which contains ACE2 receptors responsible for attachment and entry of virus in tissues) or as an immune response cannot be commented. Due to the uncertain nature of the disease and highly infectious nature, anterior chamber paracentesis and RT-PCR of aqueous humor could not be performed which would have given a better insight into uveal involvement in COVID-19.

The disease may not stop in the anterior chamber and iris. In a recent paper published in Lancet showed that Fundoscopy of 12 adult COVID-19 positive patients from Brazil had cotton-wool spots and micro-hemorrhages indicating ischemic changes in the papillomacular bundle without intraocular inflammation.[6]OCT (optical computerized tomography) of these patients showed hyper-reflective lesions in the ganglion cell (GC) and inner plexiform (IP) layers of all patients. As the features of this novel disease are unveiling, we now see thromboembolic events as complications of COVID-19. The ischemic changes seen on OCT of these patients might have a thromboembolic nature.

Although percentage of ocular symptoms other than conjunctivitis are few in humans, in animal studies, conjunctivitis, subconjunctival hemorrhage, uveitis, retinitis, and optic neuritis are well documented with corona virus, especially in murine and feline cases.[7]

Lack of sufficient data regarding ocular manifestations of COVID-19 is attributed to the severity of the systemic disease. Patients of COVID-19, admitted in hospitals are fighting for life and ocular examination at that stage becomes a secondary protocol. Un- hospitalized COVID-19 positive patients are also isolated and ocular examination is not performed unless there is an urgent or emergent need. Even under these circumstances, few other ocular complications are also reported. Dinkin et al have described two patients with cranial nerve palsies with Ophthalmoparesis along with the abnormal findings on MRI. However, the natural course of these palsies and prognosis is still to be studied.[8] Case

reports of Central retinal artery occlusion and ophthalmic artery occlusion are sepsis-induced hypercoagulability complications associated with COVID-19 as reported by Acharya S et al.[9] and Dumitrascu et al.[10]

As the situation is being brought under control and new protocols for examination of the patients and management are being developed, it is hoped that more ocular data will be available which will help in controlling vision-threatening complications.

Although it cannot be confirmed that anterior uveitis in our case was caused by Corona virus but as the disease is a multi-system disorder and also having evidence of another case report of bilateral anterior uveitis, the possibility cannot be ruled out. As the disease is evolving, new case reports are being reported which are yet to be confirmed. However, as the anterior uveitis in this particular case was associated with the follicular conjunctivitis which is indicative of viral infection and also because receptors of virus particles have been detected in the eyes of COVID patients,[2] there is a very high possibility that this RT-PCR proven COVID patient had COVID uveitis. Secondly, taking intra ocular sample to confirm the virus presence could have been unethical in this case. Purpose of reporting such cases is to perform animal studies and confirm the evidence.

It is true that systemic diseases are often related with bilateral uveitis but that is not a hard and fast rule. Many infectious uveitis for example Toxoplasma, Toxocara and others present as unilateral uveitis. Syphilis uveitis is unilateral in 50% cases.[11] There are other examples as well. Hence, the possibility of unilateral acute anterior uveitis in a COVID patient cannot be ruled out.

Limitation of our report is that conjunctival swabs could not be taken and RT-PCR of aqueous humor was not done. Even if we were able to take the swabs, recent literature shows that presence of virus in the tears is transient and the virus may not be obtained from conjunctival swabs after sometime.

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