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Mini Review Article

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The Novel Coronavirus SARS Cov-2 and its evolving impact on Ophthalmic Practice

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Introduction

SARS-Cov-2 is a novel coronavirus that is believed to have emerged from the wet markets in Wuhan, Hubei Province in China late in December 2019. The spread of this virus was soon declared to be a pandemic by the World Health Organisation, with nearly 1 million cases reported worldwide by 31st March 2020 [1]. Those who contract the virus can go on to develop coronavirus disease 2019 (COVID-19) – with symptoms commonly presenting as fever, dry cough and associated fatigue [2]. These symptoms can progress to difficulty breathing or shortness of breath, chest pain or pressure, loss of speech or movement [3]. The high risk of mortality and morbidity of this illness has resulted in worldwide awareness and control campaigns, resulting in varying levels of movement restriction and containment measures implemented to reduce the rate of transmission of SARS-Cov-2.

As of now, there are still evolving measures relating to surveillance, contact tracing, quarantine and diagnostic tests being developed as well as protocols for symptomatic individuals. The transmission of the virus is still being heavily studied and the current consensus is that similar to SARS, the main avenues of transmission include through droplets, contact and fomites [4].

This article intends to review the current information available on ophthalmic manifestations of COVID-19 and how it has affected Ophthalmic Practice in 2020.

Ophthalmic Manifestation

In a study carried out on 38 patients in the Hubei province of China, it was found that a third of SARS-Cov-2 positive patients also had ocular manifestations. This included conjunctivitis, chemosis, hyperemia, epiphora in addition to increased secretions. This is consistent with previous coronavirus infections, which have previously been known to cause a myriad of ophthalmic conditions including conjunctivitis, retinitis, anterior uveitis and optic neuritis [5].

It was noted that ophthalmic manifestations presented in patients who suffered a more severe COVID-19 response [6]. These findings were further supported by a systematic review and meta-analysis, which found that conjunctival injection was present in 2.3% of severely affected patients [7].

The pathophysiology of ocular manifestations and how it relates to COVID-19 is not clearly understood. It has also been found that patients who are SARS-Cov-2 positive and have ocular symptoms, also have tears which contain the presence of SARS-Cov-2, which may also play a role in disease transmission [4]. Additionally, it has also been reported that there is potential for transmission through mucous membranes of the eye with tear droplets passing through the nasolacrimal duct into the respiratory tract, where it continues to replicate and cause respiratory symptoms [8].

It is understood that ocular manifestations in COVID-19 can occur in the middle stages of the illness (around day 13). This is supported by the case report by Chen et al - a 30 year old male patient, who presented with bilateral acute follicular conjunctivitis and was SARS-Cov-2 positive, after which stage his viral RNA load had decreased. He was treated with Ribavirin eye drops which lead to a symptomatic improvement in his conjunctivitis [9].

Effect on Ophthalmic Practice

As ocular presentations occur in severe COVID-19 cases, this puts ophthalmologists at risk of contracting COVID-19. During the peak of coronavirus infections, it is likely that the patients they see who have developed ocular symptoms, could also be highly infective, putting ophthalmologists at risk of acquiring the infection whilst carrying out ophthalmic care. There have unfortunately already been ophthalmologists who have contracted COVID-19 infections during their duties, some of whom have unfortunately passed away (one notable case being an ophthalmologist who contracted it from an asymptomatic patient suffering from angle-closure glaucoma) [4]. Additionally, this has also been documented to occur where ophthalmic practitioners have been affected despite extensive protection with protective suites and N95 respirators [10].

The risks that present to ophthalmology practitioners may be reinforced due to the multiple steps involved in ophthalmic exams such as assessing visual acuity, intraocular pressure and the

dilation of pupils. This results in patients spending extended periods of time in hospital compared to many other outpatient services, with clinicals often being crowded, leading to a significant spread of SARS-Cov-2 in the department. To minimize such risks, it has been suggested by Lai et al. that the following measures be implemented [11]:

1. Administrative control - This involves lowering patient attendance for non-urgent procedures whilst ensuring high levels of infection control. Triage systems will need to be developed and implemented according to local protocol and sub-specialty requirements.

2. Environmental control measures - These include screens/ breath-shields on slit lamps acting as barriers to droplets being transmitted from patient to practitioner. It has been noted that the use of slit lamps in addition to an array of other ophthalmic instruments are a source of transmission for the virus. Frequent disinfection of instruments and surfaces with alcohol-based solutions containing isopropranolol or ethanol have been shown to be very effective in reducing viral titers within clinical areas [1].

3. Use of Personal Protective Equipment – This must be emphasised in the practice of approaching all patients, and for working within the clinical area, with particular emphasis of isolation gowns, gloves, caps, surgical masks/N95 respirators, and eye protection [11].

Rise of Telemedicine

Whilst ophthalmic departments are adapting to the challenges faced by the SARS-Cov-2 pandemic, it has allowed the role of telemedicine in Ophthalmology to flourish. It minimizes patient contact reducing the spread of transmission (via saliva, coughing, sneezing and talking in close contact). These services include telephoning patients to discuss symptoms and determine whether they need ocular examinations. This has also been followed up by video consultations, where ophthalmic doctors have been able to review patients with less urgent presentations.

Where patients have needed more investigations for their ophthalmic presentations (i.e. refraction, slit-lamp assessment, ophthalmoscopy, field assessment and other imaging modalities), patients can be reviewed in person in separate investigation and treatment areas for suspected or confirmed Covid-19 positive patients [12].

However, the rise of telemedicine has also come with its challenges and barriers. The most common of these barriers include computer literacy, lack of availability of high-speed bandwidth, lack of equipment, and age-related factors [13]. This can lead to greater health inequalities, leaving the most vulnerable without adequate access to the ophthalmic care they need.

Conclusion

The emergence of the SARS Cov-2 virus has introduced new, unprecedented challenges to ophthalmologists delivering care across the world. It has put clinicians at risk of contracting the disease whilst trying to care for patients. There are steps and measures that can be implemented to mitigate and minimize this risk, such as administrative, environmental control, and the use of PPE. The use of telemedicine has been revolutionary in protecting clinicians and minimising the risks of transmission, however, there is still more to be done to ensure that the care of the most vulnerable patients are not adversely affected.

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