VIEWPOINT

Perspectives on Coronavirus Disease 2019 Control Measures for Ophthalmology Clinics Based on a Singapore Center Experience

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In December 2019, a coronavirus, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which causes the coronavirus disease 2019 (COVID-19), emerged from Wuhan, China. Since then, the World Health Organization (WHO) has declared this a public health emergency of international concern because of the global spread. As of March 2, 2020, there are 88 948 cases among 65 countries, including 3043 deaths.[1] The spread has continued across all continents except Antarctica and is rapidly being identified in more and more states in the US.

While modes of viral transmission are still currently being researched, there have been anecdotal reports of ocular transmission.[2] The RNA of SARS-CoV was previously identified in tears in 2003.[3] Given the genetic similarity of SARS-CoV-2 and SARS-CoV, as well as the purported use of similar mechanisms to infect host cells, ocular shedding of viruses is a possibility that should be recognized by practicing ophthalmologists around the world.

Before appearances in Europe, North America, South America, and Africa, Singapore experienced local transmission in multiple clusters across the country. The National University Hospital Department of Ophthalmology, a high-volume ophthalmology center in Singapore, therefore provides an example of infection control measures implemented in the setting of COVID-19 infections that may be of value as other ophthalmology clinics begin to experience and plan for potential increases of COVID-19 risks. Such awareness may allow ophthalmologists to balance the infectious disease risks with continuing care for ophthalmology patients during this unique period, prompting this perspective of infection control strategies at the National University Hospital Department of Ophthalmology (Singapore) for consideration by other departments around the world addressing their infection control protocols at this time.

Patient Stratification in the Clinic

During epidemics, achieving a balance between infection control and the provision of ophthalmology services is crucial. COVID-19 potentially can be life threatening. In contrast, most ocular conditions are not life threatening or usually progress over a longer time. Hence, identifying patients at risk of infection and determining the risk-benefit profile of treating their ocular issues is crucial.

At the National University Hospital Department of Ophthalmology, in the current setting of COVID-19, patients with routine follow-ups currently are triaged by 3 criteria: (1) presence of infective symptoms or signs (eg, fever, cough, or shortness of breath), (2) a visit to China during the past 14 days, and (3) close contact with patients who received a diagnosis of COVID-19. For those who do not meet any criteria, the ophthalmology visit proceeds as usual. Those fulfilling 1 criteria are further triaged on the urgency of their consultation, recognizing that recommendations from the US Centers for Disease Control and Prevention include not only identifying those with fever, cough, or shortness of breath, but also who have been in close contact with a person known to have COVID-19 or who has recently traveled from an area with widespread or ongoing community spread of COVID-19.[4] At the National University Hospital Department of Ophthalmology, a team comprising ophthalmology trainees and ophthalmologists review the case notes and obtain an ophthalmology history via telephone to determine the urgency for follow-up. Patients who are deemed stable and attending routine follow-ups have consultations postponed. Patients with urgent ocular issues will proceed with a full consult in an isolation room with physicians wearing gowns, surgical masks, eye shields, and gloves. In the scenario that a patient has a fever, an N95 mask will be worn instead.

Patients who fulfill 2 or more criteria are triaged to an isolation room where the team reviews them with full personal protective equipment (PPE), including a gown, N95 mask, face shield, and gloves. These patients are reviewed for their ocular condition and possible pneumonia. If signs of pneumonia, such as poor oxygen saturation and lung crepitations, are heard, the patient is sent to the emergency department for further evaluation. Otherwise, the patient will be sent to a community general practice for further evaluation. This system allows the continued review of healthy patients and identification of at-risk individuals for further triaging. Care for patients with urgent ocular issues is therefore not compromised and appropriate PPE presumably protects clinicians from infection.

Protection of Health Care Workers

During the 2003 SARS-CoV crisis, health care workers (HCWs) represented approximately 20% of those with infection.[5] Hence, adequate protection for HCWs against infection is crucial. Close monitoring for HCW transmission is also important for implementing early containment measures.

While it is easy to recommend the PPE offering the most protection for all scenarios, overuse will lead to diminishing supplies and higher infection risk as the epidemic escalates. To prevent this, the PPE worn by HCWs at the National University Hospital Department of Ophthalmology depends on the risk of infection; for all

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patients who fulfill 2 criteria, the full PPE of N95 mask, gown, face shield, and gloves recommended by WHO are worn. For patients who have positive results for only 1 criteria, a gown, surgical mask, face shield, and gloves are worn instead. If these patients are febrile, the N95 mask is worn.

To reduce droplet transmission from sporadic coughs and sneezes by patients during the slitlamp examination, a protective shield made of previously used radiography films has been implemented. Droplets from sneezes can travel up to 6 m.[6] While not clinically validated, avoiding a direct sneeze or cough may reduce the number of droplets reaching the physician's face until appropriate tests of these presumed protective measures are evaluated. The shield can result in difficulty performing routine ophthalmology examinations, as it forces the examiner to adopt a relatively awkward hand position. Further design improvements are currently being considered.

Monitoring of HCWs is also important for infection control. All HCWs have to report twice-daily temperatures on an online system and indicate the development of any infective symptoms. All travel plans must be declared for contact-tracing purposes. These measures ensure early identification of HCW infections so that quarantine measures can be administered promptly to all affected personnel.

Equipment Sterilization

Similar to the WHO recommendations, all shared equipment having contact with ocular tissues, such as slitlamps and b-scan probes, are disinfected with 70% ethyl alcohol after use. Studies have shown reductions in surrogate coronavirus infectivity when treated with ethyl alcohol.[6] A 10% diluted sodium hypochlorite is used to sterilize intraocular pressure monitoring devices, such as the Goldman tonometer. Commonly known as bleach, it also has been shown to effectively inactivate various coronaviruses.[7] Isolation rooms used to examine patients with positive criteria are terminally sterilized before the next use. These disinfection protocols do not differ from daily clinic protocols.

As more information about COVID-19 emerges, these measures likely will continue to undergo revision to try to ensure eye care services can be provided safely. Meanwhile, these measures may serve as a starting point for those beginning to consider this new threat for ophthalmology practices, especially in areas where the number of cases may climb rapidly in the near future.

ARTICLE INFORMATION

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