



COVID-19 Epidemic: View from an Ophthalmologists Eye

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Abstract

COVID-19 pandemic is one of the worst medical emergencies the world has seen in quite some time. Still surrounded by a lot of controversies, it has managed to give all clinicians a run for their lives. In present circumstances, it remains of utmost importance that the right practice guidelines are made to reach clinicians in every possible way. Ophthalmologists remain an important link with coronavirus after preliminary reports of conjunctival and tear related spread in Chinese literature. There has been a lot of speculation and confusion for ophthalmologists in such circumstances. They do not want to disregard patients and at the same time are worried about the community spread from any probable case reporting to them. In such scenarios, it becomes critical to understand the current standard operating protocols for ophthalmologists.

Keywords: COVID-19; Epidemic; RNA virus; Ophthalmologists; Droplet Transmission

COVID-19: The Spectrum of Disease

SARS-CoV-2 is an enveloped, single-stranded RNA virus. It is highly transmissible and has a significant fatality rate which is evident by the large numbers worldwide. Case fatality rate is particularly higher in the elderly, immune suppressed, pre-existing lung disease and other comorbidities.

It presents in the form of flu like syndrome with high fever, dry irritating cough and shortness of breath. Also diarrhea, headache, eye pain and conjunctivitis have been reported in some. Complications include severe pneumonia, acute respiratory distress syndrome, renal failure and cardiomyopathy. Though the reported studies have mentioned a mean incubation period of 5 to 7 days, recent trends show the possibility of a longer asymptomatic period.

Transmission

The primary mode of spread is droplet infection [1]. Droplet transmission occurs when a person is in close

contact (within 1m) with someone who has respiratory symptoms i.e. exposed to a coughing or sneezing person and is therefore at risk of exposure of mucosal surfaces to potentially infective respiratory droplets [2]. In addition touching an object or surface with the virus present from an infected person could also act as a potential vector. Various recent studies have been done on the duration of persistence of the virus in environment or surfaces. These have shown a range from up to 3 hours in aerosols to up to 3 days on plastic and steel surfaces [3,4].

Ophthalmic Links

After an initial report of one of the COVID-19 patient having conjunctivitis in a study from China [5], there was a surge of interest in finding ophthalmic links of the virus. Soon thereafter, another study from China with a larger sample refuted any major transmission modes by conjunctiva by saying that only 9 out of 1099 patients had minor conjunctival congestion only and did not have to consult an ophthalmologist [6]. Conjunctival swab positivity

was reported in another case series from Hubei province, china in 2 of 38 clinically confirmed hospitalised patients of coronavirus. Though none of the studies definitely confirmed the ties of coronavirus to ocular secretions, there are still multiple upcoming studies trying to build up on the possible association. Despite weak evidence, in the possibility of any ophthalmic complaints as the primary presentation in a suspicious patient, an ophthalmologist might be the first encounter. Hence the need to equip the ophthalmologists.

Preparing for the Encounter

In the present scenario, it is of utmost importance that doctors in India be trained enough along with providing them necessary protective equipment for themselves. As ophthalmologists it is important for us to be able to limit spread of the virus among our patients by identifying at risk patients and more so by maintaining the safe chain while catering to other patients. Ophthalmologists are frequently involved in close contact with multiple patients be it in our opd or inpatients services. During heavy opds we come in contact with a large number of patients while examining their eyes. Unprotected ocular surfaces have been identified as one of the risk factors for transmission.

American academy of ophthalmology in its guidelines has advised ophthalmologists to wear protective gear including a mask covering nose and mouth along with protective eye gear [5]. Apart from this, there are various ways in which we as ophthalmologists can prevent our patients and ourselves from the risk of infection.

Prevention Is Better than Cure

- a) Screening of all patients with fever, cough or respiratory distress at the registration itself and advising them to defer non urgent ophthalmic consultation. Travel history must be promptly taken and any recent travellers with above symptoms must be red flagged and intimated to the nearest COVID facility. In private OPDs, only one patient in the waiting room or reception area should be entertained and others should be made to wait outside.
- b) Limiting attendants of patients outside of OPD rooms to decrease crowding. No unnecessary accompanying person should be allowed in the exam room. Any accompaniments of patients other than relevant documents should be left outside. If possible shoe covers must be given to the patients. At all times, doctor patient distance must be maintained as per protocols. Close examinations must be avoided as far as possible.
- c) Limiting all non-urgent contact procedures like tonometry and palpatory examination (if necessary only to be done with disposable gloves, change for each patient). Non-contact tonometry should be preferred

- d) Using disposable single use alcohol swabs to frequently clean slit lamps between patients. Use of barrier films or shields over slit lamp to prevent aerosol spread while examination. Avoiding any verbal communication with the patient over a slit lamp. Wearing a surgical mask or if possible a triple layer N95 mask when examining on slit lamp.
- e) Deferring all elective surgeries and ward admissions for the routine OTs. Rescheduling only upon clearance from health and government authorities. Triaging the mandatory OT patients. Many surgical facilities have incorporated prophylactic testing for COVID-19 for all pre-operative patients. However in wake of the current scenario of dearth of testing kits, such a decision should be viewed in a larger sense.
- f) Sensitizing population through informative pamphlets and verbal communication. It is very important to make them aware that anybody could be infected and still be asymptomatic. At such times, it becomes critical not only to save themselves against the contagion but to restrict the spread in case they might have it themselves.
- g) Regular and frequent cleaning of surfaces in repeated contact like door handles, machine switches, trial frames, near vision charts and furniture. The role of sanitary workers and cleaning staff cannot be emphasised more. Examination chairs must also be cleaned frequently.
- h) Any new viral or low grade conjunctivitis patients to be specially counselled to get tested and take proper precautions to avoid spread to family members.

Facing the Virus

Despite preventive measures, in times ahead we might be faced with situations where we might have to operate or give preliminary care to a COVID-19 diagnosed case. Thus preparation and practice of guidelines in such cases is mandatory. American college of surgeons has given protocols for operating on COVID-19 patients [7].

- i. Develop a dedicated COVID-19 OR to control the spread of the disease.
- ii. Empty OR of all nonessential materials.
- iii. Consider a negative pressure anteroom with separate access if possible.
- iv. Anteroom is used for donning/doffing of personal protective equipment (PPE) and separate OR carts for the COVID-19 OR.
- v. Separate OR airway cart; specific airway guidelines for COVID-19 PUI/confirmed patients.
- vi. Separate OR equipment cart.
- vii. Separate OR medication cart.
- viii. Runner outside OR for drugs, devices, equipment.
- ix. If intubation required for OR procedure, recommend

intubation in negative pressure room prior to OR; avoid intubation in OR.

- x. Use dedicated transport ventilator if being transported on mechanical ventilation (ambulatory bag with viral filter, if ventilator unavailable).
- xi. Additional heat and moisture exchange (HME) filter and viral filter on expiratory limb of anesthesia machine circuit.
- xii. Minimize airway circuit disconnection, endotracheal tube (ETT) must be clamped if any circuit disconnection planned.
- xiii. Special PPE for OR (N95 or OR powered air-purifying respirator (PAPR), goggles or face shield, gown, boot covers).
- xiv. Provide appropriate PPE education (CDC guidance copied below) and post in anteroom in OR.
- xv. Must use N95 or OR PAPR for all aerosol-generating procedures.
- xvi. Extubation should occur in a negative pressure intensive

care unit (ICU)/ward room if possible.

- xvii. Recover patient in the negative pressure ICU/ward room or in the dedicated COVID-19 OR if negative pressure room not available.
- xviii. Consider dedicated OR teams to manage COVID-19 patients in the OR with detailed education.
- xix. Consider performing procedures in negative pressure rooms with anesthesia team support if possible.

Personal Protection Protocols

While catering to emergency patients is really important, it cannot be emphasised more that personal protection remains the rule. Correct protective equipment can go a long way to not only protecting yourself and staff members but also contain any probable community spread from your centre (Table 1) describes certain common clinical situations and measures for them.

Clinical Situation	Protective Equipment to be used
1. Emergency ophthalmic complaint requiring consultation in an asymptomatic patient with no risk factors or travel history	<ul style="list-style-type: none"> ● N95 mask/Surgical mask ● Head cover ● Disposable gloves ● Eye protection if possible ● Barrier shield over slit lamp
2. Emergency ophthalmic complaint requiring consultation in an asymptomatic patient but at risk or positive travel history	<ul style="list-style-type: none"> ● Consider sending to a COVID dedicated facility as far as possible. ● Complete PPE* to be worn in case facility is far off and serious ophthalmic issue ● Inform dedicated authorities about encounter
3. Emergency ophthalmic complaint requiring consultation in a diagnosed COVID-19 symptomatic patient	<ul style="list-style-type: none"> ● To be examined only in dedicated COVID hospital setting at all costs ● Complete PPE* to be worn ● Close examination to be strictly avoided

Table 1: Triaging of patients and personal protection guidelines.

*Complete PPE includes full coverage surgical suit with head cover, shoe covers, N95 mask, goggles, face shield and double gloves.

Sanitation and Disinfection Protocols

All opd cabins and instruments are to be thoroughly disinfected after each patient visit [8]. All patient contact surfaces should be particularly catered to. Disposable gloves should be worn during all disinfection procedures. Disinfectants as per CDC protocols that should be used are:

- a) Isopropyl alcohol solutions with at least 70% alcohol- can be used with cotton or in the form of single use swabs.
- b) Disinfect (damp wipe) all contact surfaces with a cloth saturated with 1% sodium hypochlorite solution. These

surfaces may include stretcher, Bed rails, Infusion pumps, IV poles/Hanging IV poles, Monitor cables, telephone, sharps container. Allow contact time of 30 minutes and allow air dry.

- c) Mop floor with 1% sodium hypochlorite disinfectant. Discard disposable items and infectious waste in a yellow biohazard bag. The interior is sprayed with 1% sodium hypochlorite. The bag is tied and exterior is also decontaminated with 1% sodium hypochlorite and should be disposed as per policy.

We Shall Overcome

In such times, taking the outbreak seriously itself will curb the number of cases. Self-care and adequate measures to restrict unnecessary or non-mandatory travel (including local) should be undertaken. As ophthalmologists we need to be vigilant and prepared for an upcoming rise in cases as conjunctival spread has been reported. Unless we segregate cases and contacts from now it we are bound to face a heavy number of probable patients risking rapid and exponential transmission of the contagion. So let's be primed and equipped.

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