

## COVID-19 and Nursing Care of Ophthalmic Patients During Pandemic

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### ABSTRACT

**Background:** The corona virus, a novel, enveloped single stranded RNA virus (sarscOv-2) which has mainly affected respiratory system with life threatening results. The SARS-CoV-2 has been detected in several body fluids including tear and discharge of patients suffering from conjunctivitis. The aim of this paper is to explore the nursing care of person with ophthalmic problems.

**Methods:** A literature review was conducted using data based of Google scholar, Google, Pubmed, Medline since 2015-2023.

**Results:** An ophthalmic nurse can play a key role in teaching a patient and their attendants about general eye care and protection of vision during COVID-19 monitoring the patient's condition, as well as ophthalmic instruments after it's use have been are two main responsibilities of the nurse working in the ophthalmic units. Nurses also have responsibilities to maintain the safe and clean working environment of the unit, making the environment clean and safe.

**Conclusion:** The environment of the eye ward must be clean, safe and free from organism. A nurse should warn the patients not to touch or rub the eyes and dressings or eye shields with unprotected hand during this COVID-19 pandemic.

**Keywords:** ACE 2, Conjunctivitis, Corona virus, COVID-19, Ocular manifestations, Ophthalmic nurses.

### INTRODUCTION

Nowadays novel Corona virus disease (COVID-19) is a global public health problem mainly affecting respiratory system with life threatening results<sup>1</sup>. Till now daily life has been jeopardized in all services including eye care facilities. SARS- CoV-2 is a Corona virus that cause COVID-19 which is highly contagious disease transmitted through direct or indirect contact with infected people or contaminated surfaces<sup>1</sup>. Several research articles are published which evaluated the ocular findings in patients with COVID-19. Ophthalmic nurses can play a crucial part for prevention and control of ocular diseases that may be due to COVID-19. Since eye is a very delicate and important organ, it's care and protection during COVID-19 is of the utmost importance. COVID-19 has some ocular manifestations that should not be ignored as the ocular surfaces can also be a mode of transmission of disease through tears and other

ocular secretions<sup>2</sup>. Ophthalmic nurses can teach the client and family members about home care of an eye for prevention of eye infection due to COVID-19. Ophthalmic nurses can advise for scrupulous eye care and hygiene to minimize viral transmission through person to person contact<sup>3</sup>. Eye health professionals are at risk to contract COVID-19 because they have to adhere to significant proximity necessary for procedures like Ophthalmoscopy, Retinoscopy, Slit lamp biomicroscopy etc. So a great care should be taken by them to be in safe condition<sup>4</sup>.

### COVID 19 and MECHANISM OF EYE INFECTION

The novel Corona virus can enter our body through our eyes in addition to our nose and mouth. If somebody suffering from Corona Virus sneezes, coughs or talks, he/she spreads droplets that contain virus. The healthy individuals are now most likely

to breathe in those droplets and suffer from Corona virus. Corona virus targets the angiotensin converting enzyme 2 (ACE 2) receptors in airway epithelium, mainly nose and upper respiratory tract mucosa. Such receptors are present in corneal and conjunctival epithelium as well. Angiotensin converting enzyme 2 serves as the receptor for the virus which is transmittable through human tears and ocular secretions<sup>5</sup>. The conjunctiva of an eye is easily exposed to infectious droplets and fomites during close contact with infected individuals and contaminated hands. Anatomically mucosa of the ocular surface and the upper respiratory tract are connected by the nasolacrimal duct<sup>6</sup>. So when the infected droplets comes in contact to eyes, it is partially absorbed by the cornea and conjunctiva but mostly drained into the nasal cavity through nasolacrimal duct and then transported toward the lower part of respiratory tract including nasopharynx and trachea. The pathogens can later be swallowed into the gastrointestinal tract spreading the infection<sup>4</sup>.

## **OCULAR MANIFESTATIONS OF COVID-19**

Most of the current literatures have shown that acute follicular Conjunctivitis with bilateral diffuse red eye (Viral) is the main ocular manifestation of COVID-19 with average duration of 5.9 days<sup>4</sup>. Ophthalmic nurses should be fully aware about the eye diseases that might occur due to COVID-19. Some of the other ocular findings during COVID-19 are Subconjunctival hemorrhage, Keratoconjunctivitis, Episcleritis, Dry eye, Orbital cellulitis, Acute dacryoadenitis Uveitis, Retinitis, Vasculitis, Optic neuritis, Cranial nerve palsy etc<sup>6</sup>. Ocular manifestation can occur before, parallel or after the presence of systemic manifestation. One or more ocular manifestations can be seen in hospital admitted COVID-19 patients<sup>4,6</sup>.

## **ROLE OF OPHTHALMIC NURSE FOR CARING DURING COVID-19**

Nurse has a great role for managing patients during COVID-19 pandemic either infected or non-infected with corona virus. Problem in eye is very critical and sensitive which need prompt and immediate treatment. So in hospital, a number of clients with various eye problems came for the treatment even

in pandemic situation, related eye problems. Those clients might be infected with COVID 19. Therefore, corona virus may be spread all around the hospital surrounding such as in patients department and out patients department such as surgical area or operation theaters, diagnostic and ophthalmic procedure room, and nursing. Nurses have great responsibility for managing all area for minimizing the risk of getting infection.

### **1. NURSING CARE AT SURGICAL AREA**

A nurse should constantly update herself with the various ocular pathogens during COVID-19 and ophthalmic equipments that can play a role for transmission and contamination of Corona virus during ocular examination and surgical procedures. In the beginning use of the standard masks constantly by patients, eye care providers and visitors should be motivated<sup>8</sup>. Nurse is a first person to arrive at the operation theatre in the morning to see the cleanliness of the section. All the surgical equipments must be sterile for the day's work<sup>9</sup>. She must instruct to the patients who are undergone surgery to never touch their eyes, eye dressing or eye shields specially during COVID-19 pandemic. A nurse should monitor whether aseptic techniques are carried out in Operation Theater and minor operation procedure room or not to prevent contamination from pathogens<sup>10</sup>. During the operation or any procedures, all ophthalmic personnel should use gowns, gloves, masks, N95 respirators, face shields with goggles. The door should be kept open and all rooms well ventilated. All ophthalmic surgeries must be day care unless mandated. Moreover simultaneous double table surgery protocol should be discarded and single room single patient at one time is recommended to ensure limited people for each procedures. Masks should be provided and continued in the patients before, during and after the surgery. During the pandemic, a larger eye drapes with sizes of 80X80 cm or even more should be used. A cotton tip applicators should be used to manipulate the eye lids instead of touching with fingers to separate them. Before the surgery, it is recommended to request for chest X-ray as a routine investigation to rule out active pulmonary infiltration. After attending a suspected or confirmed case of COVID-19 in case of immediate ophthalmic emergency, disinfection of all surfaces that may have come in contact with a patient or any

members of the surgical team should be done. Proper cleaning of frequently touched surfaces such as door knob, bedrails, table tops, light switches of a surgical room at two hours intervals should be carried out. The active ingredients for cleaning agents include 70-90% alcohol, hypochlorite, hydrogen peroxide and phenol<sup>8</sup>.

## 2. NURSING CARE AND PRECAUTIONS AT OUTPATIENT DEPARTMENT/MINOR OPERATION THEATRE AND INVESTIGATIVE ROOMS

In the examination room or any procedure room, only one patient at a time should be allowed with no or just one attendant with one patient. One should avoid touching a patient with non gloved hands. After doing any procedures, one should immediately need to sanitize the gloved hands before writing a typing a case details. Maintaining a adequate distancing is important while talking to a patient or their attendants<sup>11</sup>. A nurse should give instructions prior to the procedures and avoid talking while examining a patient. Initially viral like conjunctivitis can be a presenting symptom of COVID-19, so such an individual should be treated with extra caution as early detection may result with improved prognosis and mitigate spread. Special precautions are needed during the ophthalmic procedures like lacrimal irrigation and probing, intraocular pressure measurement with contact tonometry, slit lamp examination, ophthalmoscopy, gonioscopy, biometry and ultrasonography of a patient<sup>4</sup>. Breath shields should be mounted on any ophthalmic equipment like keratometer, non contact tonometer and optical biometer. Ophthalmic equipments like B scan probes, trial frames, chin rest and forehead rest of various instruments, breath shields should be sterilized using 70% ethyl alcohol or isopropyl alcohol. Instruments that come in direct contact with ocular surfaces like tonometer tip, gonio lens, laser lens etc should be immersed in 1:10 sodium hypochlorite or three percent hydrogen peroxide for five minutes and wiped with 70% ethyl alcohol or isopropyl alcohol. During ophthalmic procedures, disposable instruments can decrease the risk of transmission of virus. All ophthalmic procedures should be done with proper personal protective equipment and gloves, give instructions prior to the procedures and avoid talking while examining. For a patient with confirmed or

suspected COVID-19, ophthalmic consultation should be completed within the quarantine ward to avoid cross infection<sup>12</sup>. Through cleaning of ophthalmic instruments before and after every new case should be done while performing tests like Gonioscopy, Tonometry, Keratometry, OCT, Fundus photos, A scan/B Scan, Visual field etc. The wall and floor of the examination rooms should be cleaned every two hours. The practitioner should speak as less as possible and a patient should also be informed not to speak a lot. Hand washing to be preferred over alcohol based hand sanitizer before and after examining each patient and also before touching any equipment used for ocular examination. All patients care area and even waiting area including floor, furniture and fixtures should be cleaned at least two times a day. Similarly mopping with one percent sodium hypochlorite should be done at the evening after out patient department finishes it's examination procedures<sup>11</sup>.

## CONCLUSION

Caring for ophthalmic clients, a nurse needs to be fully familiar with common ocular manifestation of COVID-19 and its management in hospital as well as in a home. Acute red eye with follicular conjunctivitis are often noted ophthalmic symptom of clients with corona virus infection. Transmission of corona virus among people is very high during pandemic even from the ocular surface, tears and other secretions through eyes. To prevent the transmission from the ocular surface, ophthalmic nurse have great role and responsibilities by using PPE, obtaining knowledge and skill for caring and proper cleaning the contaminated surface such as indoor and outdoor department.

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