

Challenges of wearing face masks in ophthalmology during the COVID-19 pandemic

Dear Editor,

The current coronavirus disease 2019 (COVID-19) pandemic has affected health care services deeply. During the pandemic, wearing face masks in health care environments, particularly in ophthalmic practice, is strongly recommended.^[1] Wearing a face mask can have some drawbacks in ophthalmology, including lens fogging,^[2] mask wetting and staining with drops or antiseptic agents, increased chances of dry eye disease,^[3] and facilitating the dispersion of particles into the eye during intraocular procedures.^[4]

Lens Fog

Exhalation through the superior border of the mask can cause lens fogging. This problem is common in all types of cloth, surgical and N95 masks, regardless of their design.^[2] One of the main concerns regarding lens fogging is encountered during checking visual acuity with trial lenses. The lenses can become misted by exhaled air without the awareness of the patient, especially in children or nonverbal cases. Under such conditions, the patient cannot reach the best-corrected visual acuity without any explicable reasons.

Unreliable visual field testing due to the fogging of the perimeter trial lenses is a commonly reported problem, which can cause a high fixation-loss rate and introduce artifacts in visual fields, which can lead

to a misinterpretation. Previous studies showed no differences in these artifacts due to the type of mask. The artifacts include inferior hemifield defect, new scotoma, and enlargement of previous scotomas. They are more troublesome in glaucoma or glaucoma suspect patients because of mimicking glaucomatous optic neuropathy and progressive visual field loss.^[5]

Mask Wetting and Staining

Face masks can become wet by anesthetic or mydriatic eye drops during ophthalmic examinations. In addition, fluorescein eye stain procedures can cause tear staining, leading to face mask color changes with resultant patient discontent.

In the operating room, during the periocular region preparation with antiseptic agents, such as povidone-iodine solution, the superior border of the face mask may unintentionally become wet and stained with the antiseptic agent, leading to patient dissatisfaction.

Dryness and Inflammation of the Ocular Surface

Due to the presence of the face mask, exhaled air flows with a temperature of around 36°C–37°C continuously upward into the eyes causing tear film evaporation and its hyperosmolarity.^[6] This process causes ocular surface dryness and inflammation that present with eye irritation and foreign body sensation. These complaints are common in subjects with prolonged and regular face-mask wearing, especially in health care providers. Hypothetically, uncomfortable symptoms of dry eye are followed by eye touching and hence an increased likelihood of virus transmission in the COVID-19 era. In addition, disorders of the tear film, as an immune barrier against infectious pathogens, may facilitate the virus contagion.

Challenges during Intravitreal Injections

Previous studies have revealed that wearing any type of mask (cloth, surgical, or N95) can cause dispersion of airborne particles (including bacteria) toward the eye when subjects talk or even breathe. In addition, wearing a face mask may not allow proper preparation of the periocular area with povidone-iodine. Furthermore, the limitation of the field of procedure may lead to contamination of surgical instruments or surgeon's gloves by the patient's face mask. Overall, wearing a face mask (regardless of its type) during intravitreal injections may increase the risk of contaminated injections and is of serious concern regarding subsequent serious complications, including infectious endophthalmitis.^[4]

Recommendations

Taping face masks to the face is a simple and useful technique to reduce air convection from the mask toward the eye and its subsequent complications, including lens fog, dry eye, ocular surface inflammation, and dispersion of airborne particles toward the eye during intravitreal injections. In this technique, the face mask must be placed as low as possible on the nose, and the entire length of its superior border is taped to the nasal bridge. Placing the mask as low as possible decreases the chance of the lower eyelid excursion and subsequent mechanical ectropion and ocular surface irritation.^[6] In

addition, the tape at the superior border of the mask can be a cover against drops traveling downhill from the eye or rubbed antiseptics at the periocular area and reduce the chance of mask wetting and staining. Nonetheless, staining of the face mask with antiseptics is sometimes inevitable. Therefore, providing patients with new face masks after operations seems to be rational.

Other recommendations to decrease air convection from the superior border of the face masks include using two masks or wearing a tie-back surgical mask. Some techniques for knotting the tie-back masks have been advocated to achieve better sealing of them.^[7]

According to previous studies, air convection and dispersion of airborne particles toward the eye are highest in patients wearing cloth, surgical, and N95 face masks, respectively. These differences are due to the tight contact of the N95 masks with the face. Nevertheless, due to the shape of this type of mask, the normal position of the lower eyelid may be disturbed and lead to poor blinking and subsequent tear film complications.^[6]

Besides the previous recommendations to decrease the chance of dry eye in the wearers of face masks, lubricant and emollient eye drops should be administered, especially in susceptible patients for dry eye.^[3,6]

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Amin Zand, Kaveh Abri Aghdam

Eye Research Center, The Five Senses Institute,
Rassoul Akram Hospital, Iran University of Medical Sciences,
Tehran, Iran

Correspondence to: Dr. Kaveh Abri Aghdam,
Department of Ophthalmology, Eye Research Center,
The Five Senses Institute, Rassoul Akram Hospital,
Sattarkhan-Niayesh St. Tehran 14456-13131, Iran.
E-mail: kaveh.abri@gmail.com

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Access this article online	
Quick Response Code:	Website: www.ijo.in
	DOI: 10.4103/ijo.IJO_2147_21

Cite this article as: Zand A, Abri Aghdam K. Challenges of wearing face masks in ophthalmology during the COVID-19 pandemic. *Indian J Ophthalmol* 2021;69:2880-2.

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