Paediatric Contact Lens Fitting During COVID-19

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INTRODUCTION

The COVID-19 pandemic which has swept the world since the start of 2020 is impacting day to day lives including contact lens wear too. Though the number of cases and deaths is growing continuously, the researchers have found no relationship between the contact lens use and COVID infection. There are specific eye disorders in children who require contact lens fitting rather than dispensing spectacles which include monocular paediatric aphakia, irregular astigmatism, anisometropia, unilateral ametropia, post trauma, aniridia, albinism, high refractive errors etc.[1] So COVID-19 should not be a hindering factor for the fitting and assessment of contact lenses in children as till now SARS-CoV-2 viruses are rarely found in the tears of patients who have tested positive for the disease.[2]

In our clinical practice in Ophthalmology, congenital and infantile cataract should be operated as soon as possible in order to promote normal visual development. Especially in a case of paediatric aphakia, contact lenses should be fitted immediately after surgery or not longer than a week period to prevent amblyopia.[3] The developing visual system of an infant requires clear vision in order to achieve maximum visual potential.[4] Visual rehabilitation with contact lenses in aphakic child even during COVID-19 permits more normal development of visual, motor and perceptual skills with compared to spectacles. Considering paediatric aphakia, contact lenses offers 15% wider field of view and reduces the image size up to eight percentages.[5] The aphakic spectacles of a child are usually around +20 D in power which make spectacles very heavy and unsightly too with extreme magnification.[6] Even in case of monocular aphakia, images of two eyes are not equal in size, so they can not be fused and lead to poor binocular visual development. Fitting contact lenses in such cases minimizes the image size difference and allows proper visual input for both eyes. So contact lenses can be worn in such cases both for optical as well as cosmetic purposes. Similarly contact lenses should be worn for a few years before a permanent visual rehabilitation with intraocular lenses (IOL).[7] Despite the fact that loss is high in a young child, continued formed visual stimuli due to inability of child to remove contact lenses himself gives it an edge over the more easily removed aphakic spectacles.

Why children are still safer for fitting contact lenses with compared to adults during COVID-19?

Considering the pathophysiology, Coronavirus targets the angiotension converting enzyme 2 (ACE 2) receptors in airway epithelium of cornea and conjunctiva. Luckily children have paucity

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of ACE 2 receptors as compared to adults. Moreover children have increased tear volume due to increased aqueous layer component and subsequently higher amounts of lactoferrin present in the tears which prevent the Coronavirus attachment to ocular surfaces. The increased volume of aqueous component minimizes the lipid deposition in lens surfaces.[8]

Fitting methodologies of contact lenses in children

In includes keratometry, measurement of corneal and pupil diameter, tear volume and quality assessment, trial lens insertion, over refraction and lens removal. But small palpebral aperture height and crying of a child might inhibit insertion and removal with tight closure of lids. So a small diameter lens should be chosen for children considering his/her age. In infants as little as one or two weeks of constant visual deprivation can result in amblyopia. Fitting a child with contact lenses while he/she is still on the operating table eliminates the potential need for a second dose of general anesthesia.[1]

Suitable contact lens materials for children: It includes soft hydrogel (HEMA), silicone elastomer, flurosilicone acryl ate etc. Among them silicone elastomer would be the first option for a child as it has higher oxygen permeability through the lenses so that child can nap with the lenses in night time without lens removal. Contact lens design would be soft, gas permeable or semi soft depending upon the refractive status of an individual. Silicone hydrogel lenses can be worn on continuous wear basis even for up to a month without removal and disinfection techniques.In extended wear modality lenses are worn for day and night for one week continuously without removal at night. After one week it is once removed, cleaned and reinserted to eyes. But in case of children, it would be safer if the lenses are removed at the end of the week and cleaned before insertion for next week. Parents are taught to insert and remove lenses from the eyes of children. So children have not to come regularly to wear lenses in hospital. It can be done in home by parent and children themselves.[9]

Specific care and concern during COVID-19: To be in safe ophthalmic practices, all the clinicians should wear personal protective equipment (PPE) including gloves, masks, face, eye shields, caps while handling contact lens All the trial contact lenses should be disinfected using three percentage hydrogen peroxide.[10,11] Children and their parents should be instructed well strict hygiene measures along with optimal wear and care procedures as few literatures have warned that human tears and ocular discharge during face to face communication and close examination of the patients may transmit the Coronavirus.[12,13] Patients should discontinue contact lens wear if cold or Flu like symptoms appear with them. Considering the recent crisis of Coronavirus, daily disposable soft contact lens of silicone hydrogel materials would be safer with compared to yearly replacement lenses for children use. Actually in COVID-19, daily disposable lenses would be safer as it needs less time or even no time for cleaning lenses. Such lenses cause less eye irritation to eyes so patient rarely touch his/her eyes due to irritation by bare hands. Daily disposable lens contain no lens deposits, so less chance of infection.

CONCLUSIONS

Since contact lenses are one of the preferred modes of immediate vision correction in children in different ocular disorders, it can be safely worn by patients without much fear of Coronavirus infection. With prompt care and maintenance education to children and parents, contact lens clinics should function as before the crisis of the pandemic.

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