

Managing the myopia epidemic and digital eye strain post COVID-19 pandemic – What eye care practitioners need to know and implement?

Dear Editor:

As India is coming to terms with coronavirus disease 2019 (COVID-19) lockdown and has been bracing for work from home in every possible field, there is also no denying that our children are going to stay at home for longer periods and are going to be taught their lessons in a virtual environment for some time in the future. This definitely poses a challenge as children would lack both proper and consistent physical activities and also the safe and effective classroom interaction that is very essential for their physical and mental well-being.^[1] Apart from the overall effects on the health of the child, as eye care practitioners it is also important to bear in mind that children will be spending more time indoors and will have fewer outdoor activities, which are known risk factors for myopia onset. Children are also going to spend more time with digital devices in the foreseeable future. The impact of digital devices goes far beyond eye health, and it becomes more important than ever to spread awareness about what potential impact these devices can have on the young visual apparatus.^[2] There are predictions of a rise in myopic refractive error—about 50% of the world's population by 2050.^[3] The current lockdown can hasten this prediction if adequate care is not taken during the home confinements. The term *quarantine myopia* is finding its place in debates and discussions in the eye care world. There are increased concerns about restrictions to community eye health programs and restrictions in travel reducing the accessibility to seeking eye care. However, the time is now more than ever to follow-up children who are at risk for myopia and who already have the diagnosis of myopia, especially progressive myopia. This editorial aims to propose certain recommendations to keep in mind while managing myopia and also to create awareness regarding myopia among practitioners, the public, and all stakeholders during the COVID-19 era.^[4] The recommendations provided below need to be disseminated through eye care practitioners across to all concerned stakeholders, including children, parents, caregivers, social workers, school authorities, policymakers, and public health professionals.

Possible side effects of excessive gadget use

Digital eye strain

Anyone who uses gadgets excessively without adequate breaks can present with eyestrain and musculoskeletal issues as part of the digital eye strain spectrum. This would demand assessment of refractive error, accommodation and vergence assessment, dry eye evaluation, and ergonomic assessment.^[5,6]

Dry eye disease

With the excess gadget usage, children can present with ocular surface disorders, especially dry eyes.^[7] This needs to be borne in mind, and dry eye assessment should be a part of routine eye examination of children when specific symptoms are present. Children should again be encouraged to follow the 20-20-20 rule of taking 20 sec break to look at objects 20 ft away from their devices once in 20 min or at least after every class lecture that they sit through.^[5] Children should be taught to blink voluntarily and completely as often as they could, to reduce symptoms of dryness.

Myopia progression

Evidence points out that sustained near work and closer working distance are important factors in the progression of myopia among children.^[8] Children, parents, and teachers alike should be educated about this and should be encouraged to follow the recommendations given below during home confinement. Special care should be taken to emphasize the importance of preventive measures given to children who are at risk for myopia like the positive history of myopia among one or both the parents, lesser hyperopic error in cycloplegia than expected age norms, and children studying in schools with excess academic pressure.^[9]

What specific parameters need to be investigated during the ophthalmic assessment?

Accommodative dysfunctions including spasm of accommodation and acute onset esotropia have been reported in the literature because of excessive gadget use.^[10] Evaluation of the phoria status and eye alignment, near point of convergence, accommodation amplitudes, accommodation response, and accommodative facility would form the minimum test battery^[11] to be able to screen for binocular vision dysfunctions. The red flags for accommodative spasm include a sudden jump or progression in myopia, lead of accommodation as assessed using dynamic retinoscopy, acute onset of intermittent or constant eso deviation, and variable retinoscopic reflex.^[12] It is

important to rule out accommodative spasm through proper cycloplegic refraction and a comprehensive assessment of binocular vision status of the child.

Receded near the point of convergence, large near exophoria, reduced near the point of accommodation, and lag of accommodation greater than +1.25 Diopter Sphere (DS) demand further assessment for nonstrabismic binocular vision dysfunctions, and vision therapy plays a significant role in managing these anomalies.^[13]

Myopia work-up guidelines

It is recommended that eye care practitioners who deal with children with myopia of new onset or progression need to include documentation of ocular biometry as a part of the evaluation process.^[13] This would help the practitioners with the decision-making process during follow-up to decide about implementing or modifying the myopia control strategy. Children whose axial lengths are greater than 26 mm need to be followed up at regular intervals, as greater axial lengths increase the risk of visual impairment.^[14]

Emphasis on outdoor activity

Emphasis on outdoor activity cannot be overemphasized. Outdoor activities and exposure to natural light are known protective factors against myopia onset and, to some extent, on myopia progression.^[15,16] With the current lockdown and the curb on outdoor activities, innovative ways to maintain adequate sunlight exposure should be considered. Children can spend at least 1 h in a day with effective utilization of spaces around the home like the terrace, balcony, and garden, as light levels are quite high even in shaded environments as compared with indoor environments.^[17] Parents can be urged to spend family time together in the day time engaging children with walk in the terrace/balcony or engaging in aerobics to keep the child's interest sustained. The Global Myopia Awareness Coalition founded in 2019 had its first campaign to raise awareness to the public about childhood myopia and available treatment options that reached 3.5 million parents through social media influencers. Their second campaign to be launched during June 2020 is about spreading awareness about outdoor activities through gaming influencers. These awareness materials can be utilized by all eye care professionals.^[18]

Visual hygiene during near work

In virtual education, giving a compulsory no-gadget break for 15 min after an hour of the continuous lecture should be shared with teachers and school authorities. Brochures can be shared to the concerned stakeholders about visual hygiene—this includes maintaining at least an arm working distance, preferably working with gadgets while having access to natural lights, reading under ambient illumination, using larger gadget screens for better resolution and reduced visual fatigue, ensuring frequent blinking to ensure that children do not develop dry eye disease-related symptoms. The font size on the digital device can be enlarged for increased visual comfort, as smaller font sizes are known to increase the cognitive demand. Text size of twice the individual's visual acuity is recommended for young, visually normal subjects for sustained comfortable reading from a laptop computer.^[19] Wearable trackers, such as the Clou-clip^[20] and smartwatch based devices,^[21] also have their application in the current situation and near future to understand the visual behavior, near work profile, and light exposure such that practitioners and parents gain deeper insights into these modifiable risk factors.

There is no substantial evidence to recommend blue cut filters based on the current evidence,^[22] nonetheless good sleep hygiene is essential. Parents can also be educated regarding web-based apps such as Family Link (by Google) that can be installed in the digital devices to monitor and restrict screen time and to set breaks and sleep time.

Children being the pillars of the country, their well-being is of paramount importance, especially during these trying times. It is the collective responsibility of health care practitioners, parents, teachers, and all concerned stakeholders to create a safe visual environment for children during this pandemic and times after. Along with educating on social distancing and hand hygiene, eye and vision health awareness need to be spread in all possible ways both now and in the times to come. Though community eye care restrictions exist, eye care practitioners need to think through strategies to enhance eye care accessibility to children who are at risk for myopia incidence and progression. One strategy is to educate schools and parents to bring children who have an existing diagnosis of refractive error and using spectacles for routine eye examination to the base hospital until community activities are restored.

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