Commentary: Impact of the COVID-19 pandemic on digital eye strain in children

The authors have highlighted the impact of increasing usage of digital devices during the ongoing COVID-19 pandemic on ocular health in an online survey conducted for adults.[1] Whereas there is no arguing about the ill-effects of this phenomenon in adults owing to changes forcefully affected by the lockdown, an equally or perhaps a more vulnerable cohort that is silently suffering this onslaught of increased digital device use, are children. Children today are growing up in an increasingly visually demanding world. Electronic devices, video games, e-readers, tablets, and laptops, and the ubiquitous mobile phone were already exploited for entertainment and leisure. The COVID-19 pandemic has increased this burden by leaving schools with no choice but to adapt to e-learning platforms. Children now spend an average of 8–12 h a day on some form of digital device. This has increased the threat of digital eye strain (DES), making it an emerging public health problem with an estimated prevalence in the community reported between 22.3% and 39.8%.[2]

Our group has reported that approximately 80% of outpatient visits in the pediatric ophthalmology department in March and April 2020 (at the start of the lockdown) were refractive errors, of which 79% were for myopia.[3] With no definitive end in sight for the pandemic, we are potentially facing an explosive scenario of this "quarantine myopia." There are predictions of a worsening of the myopic epidemic worldwide and is estimated that over 50% of the world's population will have myopia by 2050.[4] Besides myopic progression, accommodative dysfunction in children is also on the rise due to digital device usage.[5] Accommodation spasm and sudden onset esotropia are important causes. The former presents with an acute, rapid increase in myopia and requires dynamic, cycloplegic retinoscopy, and a comprehensive assessment of the binocular visual field. 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 demand further assessment for nonstrabismic binocular vision dysfunction.[6] Vision therapy plays a significant role in managing these anomalies.

We have been using three exercises in our practice to manage accommodative dysfunction in children with good results. 1) The Lens Flipper at a distance of 0.4 m [Fig. 1] – flip and re-flip a set of +2.0/−2.0D lens flipper ensuring that the text is clear with each flip.[7] 2) The Hart Chart—a pair of similar charts, one at 6 m [Fig. 2a] and the other at 40 cm [Fig. 2b] are read alternately with one eye occluded. This improves focus for both near and far.[8] 3) Brock String [Fig. 3]—a white string (3–10 feet long) with 3–5 beads of different colors. One end of the Brock string is held at the tip of the nose while the other is tied to a fixed point.[9] The child is asked to fixate on one of the further beads to begin with and should see one bead (indicating focus to a single point). The next step is to alternate from bead to bead, working closer and back to exercise the convergence muscles.

Forced gadget breaks, restriction of online classes with breaks in between sessions, promoting (permitted) outdoor activities, encouraging "family" time with non-gadget-based learning and entertainment are some measures that can be adopted. Sensitizing teachers and parents about these practices can help to check the growing ill-effects of DES.[10] As eye health care providers, we need to promptly identify those children who are at a higher risk of DES and progression of myopia to manage them appropriately. A public awareness campaign to improve safety measures,

Figure 1: Flippers

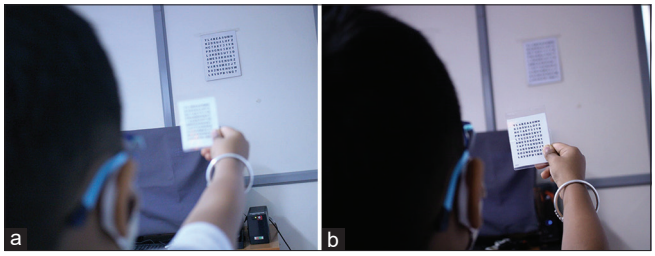

Figure 2: (a) Hart Chart for Distance. (b) Hart Chart for Near

Figure 3: Brock string

enhance early detection of DES, and promote good eye health measures in our young citizens is the need of the hour.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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