Accommodative anomalies during COVID-19 in pediatric ophthalmology: Our experience

The use of smartphones and electronic tablets has increased rapidly in India and worldwide during the COVID-19 pandemic. Prolonged near task could result in vision anomalies and associated symptoms may affect reading, academic performance, and quality of life.[1-4]

Accommodative and vergence mechanisms are an essential part of the visual efficiency system and associated binocular anomalies are disorders of the eye, resulting in inappropriate response to visual need and inability to maintain comfortable bifoveal fixation.

The symptoms experienced with digital device use may be associated with changes in the accommodative system, including changes to accommodative accuracy, accommodative facility, and amplitude. Prolonged near work induces mild conditioned spasm of accommodation due to sustained focusing at near stimulus over extended periods of time, leading to headache, asthenopia, watering, blurring, redness, lack of concentration, etc., in children.[3-5]

We did a retrospective analysis of various accommodative parameters to determine the frequencies of accommodative anomalies among symptomatic children during the COVID-19 pandemic from electronic medical record data of children with asthenopic symptoms in the department of Pediatric Ophthalmology. Subjects consisted of 83 children with uncorrected visual acuity of 20/30 or better in each eye. Accommodative assessment (testing for amplitude of accommodation, accommodative lag, accommodative facility (AF), and negative and positive relative accommodation (NRA, PRA)) was conducted over best-corrected refraction.

Accommodative facility was tested using a ±2 diopter (D) lens flipper. The target was a single line of letters corresponding to a near visual acuity of 20/30. Accommodative response was evaluated using monocular estimation method retinoscopy. Negative relative accommodation (NRA) and positive relative accommodation (PRA) were measured with positive and negative lenses, respectively, until the target at 40 cm is blur. The AF test is a dynamic measure, which assesses the overall time course or speed of the accommodative response.

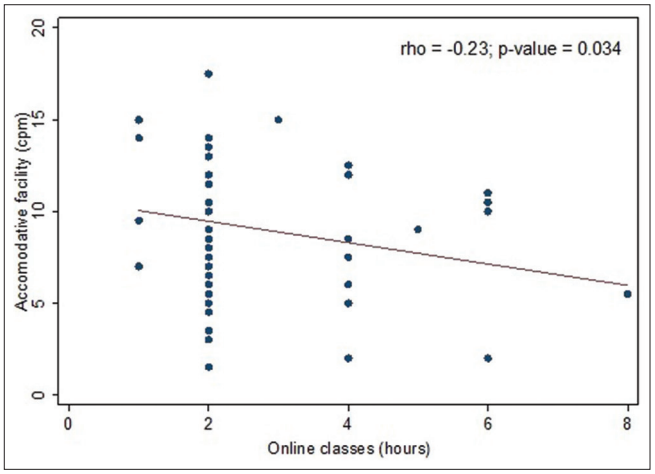

Figure 1: Scatter plot showing the negative correlation of accommodative facility (cpm) and attending online classes (h); (rho = –0.23; *P* = 0.034)

The mean (SD) of the age was 12.94 ± 3.4 years (range: 7–18 years). The mean (SD) facility was 9.11 ± 3.4 cycles per min (cpm) (range: 1.5–17.5 cpm). Mean hours (SD) of attending online classes was 2.60 ± 1.5 h (range: 1–8 h). The mean NRA and PRA were 2.52 ± 0.5 and −4.26 ± 1.6, respectively.

Total cumulative nearwork time was negatively correlated with accommodative facility and positively correlated with the number of asthenopic symptoms. Moreover, the number of hours spent on online classes was found to be significantly correlated with decreased accommodative facility [Fig. 1].

The correlations suggest a relationship between cumulative amount of nearwork, decreased accommodative facility, and asthenopia. The study results indicate a high prevalence of accommodative anomalies during the pandemic time, which needs to be timely addressed and treated.

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Conflicts of interest

There are no conflicts of interest.

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References

1. Jaiswal S, Asper L, Long J, Lee A, Harrison K, Golebiowski B. Ocular and visual discomfort associated with smartphones, tablets and computers: What we do and do not know. Clin Exp Optom 2019;102:463-77.
2. Hennessey D, Iosue RA, Rouse MW. Relation of symptoms to accommodative infacility of school-aged children. Amer J Optom Physiol Optics 1984;61:177-83.
3. Kim DJ, Lim CJ, Gu N, Park CY. Visual fatigue induced by viewing a tablet computer with a high-resolution display. Korean J Ophthal 2017;31:388-93.
4. Long J, Cheung R, Duong S, Paynter R, Asper L. *et al*. Viewing distance and eyestrain symptoms with prolonged viewing of smartphones. Clin Exp Optom 2017;100:133-7.
5. Levine S, Ciuffreda KJ, Selenow A, Flax N. Clinical assessment of accommodative ability in symptomatic and asymptomatic individuals. J Amer Optom Assoc 1985;56:286-90.

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