



CHANGING SYMPTOMATOLOGY WITH NEAR WORK DURING COVID TIMES

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Abstract: COVID 19 pandemic has affected general health of people including eye health. As life has changed greatly post lockdown, it has also affected eye health. It will be interesting to observe symptomatology of eye patients post lock down. Present study is on observation of symptoms in eye patients post lock down period. Subjects with symptomatology associated with increased near work and use of visual display terminals during COVID lockdown period were included. A vision quality scale questionnaire (VQS) was used to evaluate the significance of symptoms. Detailed history was taken. Refractive correction, anterior segment evaluation, Non-strabismic binocular vision evaluation, cycloplegic retinoscopy and fundus examination were done. Twenty-five subjects with an average VQS score of 43.26% were observed with common symptoms of asthenopia, intermittent blur and diplopia. All the subjects were in range of 8-39 years including 9 male and 16 female patients. In common, all of them had near work history including visual display terminal use approx 10-12 hours/day. An integrative analysis approach was used for the diagnosis of binocular vision anomalies. Out of 25 subjects; 8% subjects were diagnosed with convergence insufficiency, 4% with pseudoconvergence insufficiency, 20% with exophoria, 20% with accommodative spasm, and 48% with intermittent exotropia. As work from home, online study/teaching etc became mandatory in covid times, screen time of young subjects increased. More severe symptoms associated with excessive near work due to binocular vision anomalies were seen, clearly indicating changing symptomatology. Complete binocular vision evaluation and integrative analysis approach for diagnosis is mandatory for all symptomatic cases. comprehensive eye examination and counseling for visual hygiene in all cases.

Index Terms – COVID-19, Non strabismic evaluation, computer vision syndrome, Binocular vision anomalies.

I. INTRODUCTION:

COVID 19 pandemic has affected general health of people including eye health. As life has changed greatly post lockdown, it has also affected eye health. For example, classroom study is converted to online study which increases screen time. Other factors include Digital eyestrain as an effect of online teaching/learning due to covid, Problems due to excessive near work etc. These symptoms because of Asthenopia and accommodative fatigue are frequent. Sequelae of uncorrected refractive errors, prolonged activity can increase eye-focusing problems and eye irritation. Among the most frequent health-related problems reported by users of computer video display terminals (VDTs) are those related to vision.¹ Working on the computer for long periods can lead to eye discomfort, fatigue, blurred vision, and headaches. The problem is not limited to adults. Many children use computers for educational and recreational purposes. The way that children use the computer may make them even more susceptible to development of computer-related vision symptoms (Scheiman). Most symptoms are associated with computer use, although patients also frequently complain of symptoms with reading or other close work.² In most cases, symptoms occur when the visual demands of the task exceed the visual abilities of the patient to comfortably perform them. At the greatest risk for development of symptoms are patients who spend two or more continuous hours of daily computer use. Common complaints include eyestrain, headaches, blurred vision, diplopia, sleepiness, difficulty concentrating, loss of comprehension over time, a pulling sensation, and movement of the text on the screen.^{1,2} Visual conditions with serious underlying disease, almost always acute onset with associated medical problems or neurologic symptoms are seen.¹ An earlier paper on “Uncertainty factors in online education due to COVID 19 pandemic during march to may 2020 “discusses increased screen time during lock down period³. Patients seen post lock down were found to complain mostly double vision, sudden onset of visual problems and squint. It will be interesting to observe symptomatology of eye patients post lock down. Present study is on observation of symptoms in eye patients post lock down period.

1.1 PURPOSE:

To explore presentation and diagnosis of young adults with excessive near work during covid restriction period.

1.2 STUDY DESIGN: Prospective observational study

II. METHODOLOGY:

Subjects with symptomatology associated with increased near work and visual display terminals use during covid restrictions and lockdown period were included. Age range of 8 to 32 years were selected Vision quality scale questionnaire (VQS) was used to evaluate significance of symptoms.

Participants were divided into two groups Symptomatic and Asymptomatic according to the vision quality scale. Vision Quality Scale consisted of nine questions in Likert scale with six possible responses to each, with 6 representing the highest frequency and 0 representing the lowest frequency of symptom occurrence. The nine items were converted into percentage. Visual acuity was measured using snellen's visual acuity chart. Refractive error was determined objectively by retinoscope and refined by subjective refraction using fogging technique and duochrome balance. Heterophoria was determined by cover test and quantified by Maddox rod test. The accommodative response was measured by measuring the amount of accommodative lag. The monocular estimation method was done at 40 cm with subjective correction in place. Card with printed letters/ pictures or words mounted on retinoscope. Subjects were asked to read words, swept the retinoscope beam, observed the motion of reflex and quickly changed lenses to neutralize the reflex. The lowest power of lens that neutralized the reflex was recorded for each subject. Near point of accommodation was measured in centimeters with help of pushup test, monocularly as well as binocularly. Accommodative target with N8 size was positioned at 50 cm in front of patient's line of sight. Near point of convergence was measured in centimetres with help of pushup test. Vertical target with N8 size was positioned at 50 cm in front of patient's line of sight. Subject's eye movements were observed for loss of convergence to objectively measure near point of convergence. Relative accommodative measures were done with help of plus and minus lenses and blur point and recovery point were measured. Measurement of fusional reserves were done with help of prism which lead to breakdown in fusion. Step vergence method was used. Positive and negative fusional vergences were measured for distance and near. Accommodative facility was measured with help of ± 1.50 Ds flippers. First of all accommodative facility was tested monocularly as well as binocularly number of cycles per minutes were recorded. Vergence facility was measured with help of 12 Δ B0 and 3 Δ BI. Number of cycles per minutes were recorded. The normal values were considered according to Morgan's scale. Non strabismic binocular vision anomalies were diagnosed using integrative analysis approach (Dalal et. al, 2020). Data was analysed with help of microsoft excel version 2016.

III. RESULTS:

Twenty five subjects with an average VQS score of 43.26% were observed with common symptoms of asthenopia, intermittent blur and diplopia. All the subjects were in the range of 8-39 years including 9 male and 16 female patients. (Figure 1)

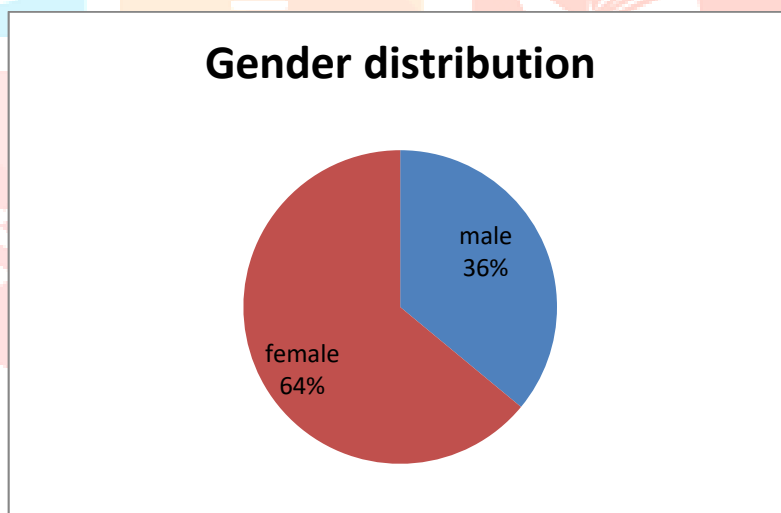


Figure 1 Gender distribution of subjects

In common, all of them had near work history including visual display terminal use approx 10-12 hours/day. Integrative analysis approach was used for diagnosis of binocular vision anomalies.

Out of 25 subjects; 8% subjects were diagnosed with convergence insufficiency, 4% with pseudoconvergence insufficiency, 20% with exophoria, 20% with accommodative spasm and 48% were diagnosed with intermittent exotropia. (Figure 2)

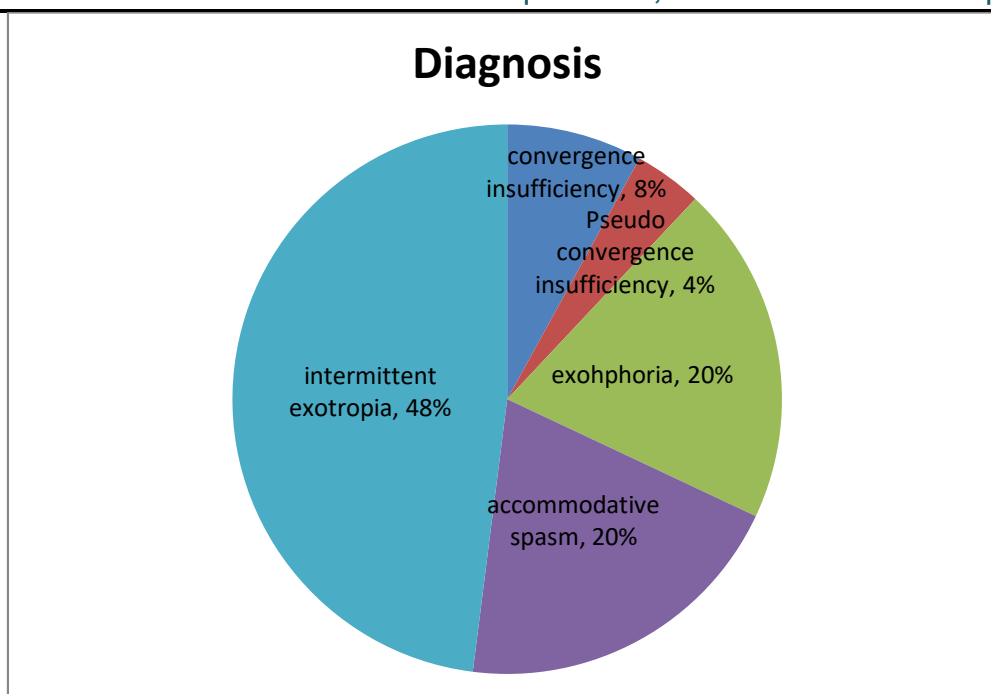


Figure 2 Diagnosis of subjects

IV. DISCUSSION:

Visual conditions associated with serious underlying disease almost always have an acute onset, with associated medical problems or neurologic symptoms, while patients with visual problems present with long-standing chronic complaints.¹ The primary functional disorders that typically must be differentiated are basic heterophoria (eso-, exo-, and/or hyperphoria). Visual acuity, pupil evaluation, comitancy testing, internal and external ocular health tests, and refraction are all critical aspects of the differential diagnosis (Schieman). Complaint in all cases were similar due to excessive use of vdt. Symptoms observed in post lockdown period were typically related to asthenopia, blurred vision, sudden deviation and sudden onset of diplopia. VQS discriminates between patients with and without asthenopia who have normal heterophoria, visual acuity, and ocular health. VQS Questionnaire was used to further differentiate among them. In all cases VQS score was less than 72% suggesting severity of symptoms. Evaluation of binocular vision involves several distinct steps including all the tests for accommodation and vergence (Schemein).

Viewing digital electronic screens is not confined to adults, teenagers and older children. A The American Academy of Pediatrics (2013) recommended that children under 2 years should not spend any time watching electronic screens (American academy of pediatrics, 2004).

It has recently been suggested that the blue light emitted from digital displays may be a cause of Dry eye syndrome, although there is no published evidence to support this claim. Blue light generally comprise wavelengths between 380 and approximately 500nm. Fortunately, the human retina is protected from short-wavelength radiation, which is particularly damaging, by the cornea which absorbs wavelengths below 295 nm and the crystalline lens which absorbs below 400nm (Margrain et. al. 2004).

In our study most of the cases with occasional deviation and occasional diplopia were diagnosed with intermittent exotropia. Study by Rahul Bhola (Bhola, 2006) suggests that, Intermittent exotropia is an exodeviation intermittently controlled by fusional mechanisms. Some patients report occasional transient horizontal diplopia, others will have a vague sense of discomfort when their eyes are deviated. Asthenopic symptoms may occur in initial phases, when fusion begins to succumb and the eyes deviate momentarily from the orthoposition. Some patients may notice symptoms like eyestrain, blurring, headache and difficulty with prolonged periods of reading. Some patients may complain of micropsia that may occur due to the use of accommodative convergence to control the exodeviation (Bhola, 2006; Khurana). Diplophotophobia is One symptom that deserves special comment is closure of one eye in bright sunlight. Bright sunlight dazzles the retina so that fusion is somehow disrupted, causing the deviation to become manifest . Thus one eye is closed in order to avoid diplopia and confusion (Bhola, 2006).

The VDTs related symptoms are increasing in the students in this COVID-19 era (Purohit et. al 2020). Proper counseling, increasing awareness, regular yearly complete eye examination, proper lighting, minimizing glare, adjusting brightness of computer screen, taking frequent blinks, refocusing eyes, blinking more often, modified workstation, exercising even while sitting, taking regular breaks, avoiding unnecessary web searching and social media can help to relive or minimize symptoms related to VDTs work (Purohit et. al 2020).

A G Nair et.al⁹ in their study, effect of COVID 19 related lockdown on ophthalmic practice and patient care in India: results of survey⁹ showed that majority of ophthalmologists in India were not seeing patients during lockdown and large proportion of them switched to telemedicine, thus decreasing chair time and minimizing tests done may lead to misdiagnosis in such cases (Nair et. al, 2020). Hussaindeen et.al studied prevalence of non-strabismic anomalies of binocular vision in Tamil Nadu and report 2 of BAND study (Hussaindeen et.al, 2016). They recommended that screening for anomalies of binocular vision should be integrated into the conventional vision screening protocol.

Due to increased near work during COVID times enhanced symptoms were observed. Therefore, binocular vision evaluation must be done with detailed symptom survey in all n subjects and explanation on visual hygiene.

V. CONCLUSION:

As work from home, online study/teaching etc became mandatory in covid times, screen time of young subjects increased. Change in symptoms due to excessive near work were observed. More severe symptoms associated with excessive near work due to binocular vision anomalies were seen, clearly indicating changing symptomatology. Complete binocular vision evaluation and integrative analysis approach for diagnosis is mandatory for all symptomatic cases.

LIMITATION: long term follow up is awaited.

TAKE HOME MESSAGE: : comprehensive eye examination and Counseling for visual hygiene in all cases.

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