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Original Research Article

Blue light filtering spectacles: The blues

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ABSTRACT

Background: With the increment of digital screen exposure for professional as well as recreational purposes, the usage of blue light filtering glasses is on a rise. Present study was conducted to assess the benefits of these lenses alone for computer vision syndrome (CVS).

Materials and Methods: It was a prospective questionnaire based survey carried out at eye OPD for a period of 2 years from August 2021 – July 2023. All subjects of age 20-40years, who spend at least 6-8 hours on screen and presenting with CVS, taken for the study. They were given the choice of blue light filtering (BLF) spectacles only treatment or eye drops (1% sodium hyaluronate) only. Those who opted for spectacles only were recruited for the study & asked to follow up at 15 days. They were asked to fill a self-designed questionnaire.

Result: Out of total 1248 patients of CVS cases presenting to our OPD during the study period, 853 cases opted for BLF spectacles only arm for their symptoms. 24 patients were lost to follow up. Remaining 829 patients filled the questionnaire completely. Nearly 90.34% cases (1168 subjects) were compliant i.e. they used the lenses while at work on screen. Only 29.80% (247 subjects) experienced relief of their CVS symptoms. Remaining 70.20% cases (582 subjects) were not happy with BLF spectacles.

Conclusion: We found no short-term utility using blue-light filtering lenses alone to reduce visual fatigue associated with CVS. The importance of risk and benefit assessment of use of these lenses is to be considered.

1. Introduction

Computer vision syndrome (CVS) is an umbrella term for symptoms associated with prolonged digital screen exposure, such as eyestrain, headaches, blurred vision, and dry eyes.[1] The American Optometric Association (AOA) defined computer vision syndrome as "a complex of eye and vision problems related to near work experienced during computer use".[2] Recent decade has witnessed an increase in CVS patients in day to day ophthalmology clinics.[3,4]

The discomfort associated can hinder work performance or recreational activities. However, the symptoms due to CVS can easily be minimized with a few preventative measures. Treatment includes rule of 20-20-20, appropriate modified lifestyle & very fancy modality in market "the blue light filtering (BLF) spectacles/lenses.[1] Nowadays, the BLF lenses are emerging as a fashion amongst the common people. Most of the time people order BLF lenses from the optical shop or online. This makes their treatment incomplete for CVS. We have tried to assess the role of blue filtering spectacles in CVS at our tertiary health care hospital.

2. Materials and Methods

It was a prospective questionnaire based survey carried out at our eye OPD for a period of 2 years from October

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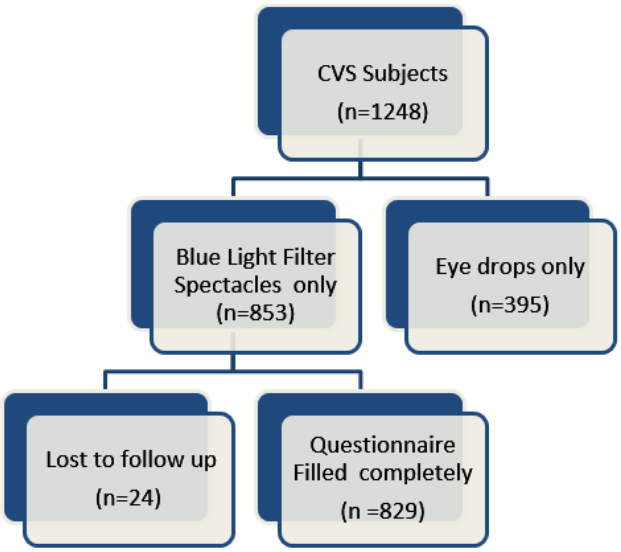
2021 – November 2023. All subjects of age 20-40years who spend at least 6-8 hours on screen and presenting with CVS, taken for the study. Survey conducted in accordance with the ethical standards of the institutional committee. They were given the choice of blue light filtering (BLF) spectacles only treatment versus eye drops (1% sodium hyaluronate) only. They were well explained about pros and cons of both treatment options. Those who opted for spectacles only were recruited for the study and asked to follow up at 15 days. They were asked to fill a questionnaire. It was a self-developed questionnaire regarding their choice of treatment, their compliance and response of prescribed BLF spectacles. It comprised of three question, response of which were based on Likert scale. One question to fill on the first visit and rest two on follow up at 15 days.

Cases of moderate to severe dry eye, example due to Meibomian gland dysfunction etc. (ruled out by schirmer test < 10mm), using eye drops in any forms, age >40years/ myopia >-2D; hypermetropes>+1d; astigmatism >0.75 D/best corrected visual acuity <20/20 were excluded as they might confound the symptoms of CVS .

3. Result

Out of total 1,248 patients of CVS cases presenting to our OPD during the study period, 853 cases opted for BLF spectacles only arm for their symptoms. Twenty-four patients were lost to follow up. Remaining 829 patients filled the questionnaire completely.



Nearly 90.34% cases (1168 subjects) were compliant with use of BLF spectacles i.e. they used the lenses while at work on screen (Table 1). Only 9.65% cases (80 subjects) reported occasional use. Only 29.80% subjects (247 cases) experienced relief of their CVS symptoms. The present study shows that 70.20% subjects (582 cases) were not happy with use of BLF spectacles (Table 1).

4. Discussion

Computer vision syndrome (CVS) is emerging as an epidemic in ophthalmology clinics.[5] It is on a rise not only amongst professionals using screens for long hours but also expands its wings to a broader group. Online classes and tutorials have attracted the attention of students to screen. Numerous daily shop shows and social platforms have not spared the common people. It is afflicting population in big numbers, who are constantly exposed to screens. Thus, visual problems are frequently occurring health problems among computer users in all age and groups.[6–8]

Commonly reported symptoms are eye strain, irritation, burning sensation, redness, blurred vision and double vision.[9,10] The strategy in the management of computer vision syndrome is eliminating the causative factor leading to the symptoms.[11,12] To prevent CVS, several environmental, postural and life style changes need to be made to improve these conditions.

Plethora of treatment options are available. Blue light filters lenses or what is also popular as blue light blocking lenses, are increasingly used as a treatment option for the symptoms of CVS by the common population. It implications has been studied upon in various studies as available in literature.[13] The actual principle by which blue-light filtering lenses might be able to help with eyestrain are unclear. One theory hypothesizes that modern digital devices emit more blue light than traditional lighting sources and used for long duration. So these blue light blocking filters might be of help. A wide range of experts claim about their potential benefits, including that they may reduce eyestrain associated with digital device use, improve sleep quality and protect the retina from light-induced damage.[14] However, merits of the blue-light filtering spectacle/lenses are still a matter of debate in ophthalmic practice.

Out of total 1248 subjects of CVS, 853 cases opted for BLF spectacles only arm for their symptoms. Our cases were mostly young students and IT professionals who are obviously more inclined towards fancy gadgets &“pomp and show” stuff. Moreover, use of eye drops 4 times a day was a matter of compliance for them. Out of 853 cases, who opted for BLF spectacles only arm, 24 patients were lost to follow up. Remaining 829 patients filled the questionnaire completely. Nearly 90.34% cases complaint with use of BLF spectacles (Table 1). Only 80 subjects (9.65%) reported occasional use. However, contrary to the excitement &preference of subjects only 29.80% subjects (247 cases) experienced relief of their CVS symptoms (Table 1). 70.20%subjects (582 cases) were not happy with use of BLF spectacles.

Similar results deduced in a review, published in the Cochrane Database of Systematic Reviews by University of London and Monash University, analyzing data analysis

Table 1: Response of participants

Question	Response (3)	(2)	(1)
How excited are you to choose BLF spectacles as treatment modality for yourself	Very excited n=483	Excited n=107	Trial n=239
Compliance to your BLF spectacles	Always n=574	Most of time n=175	Sometimes n=80
How much effective in relief of aesthenopic symptoms	Relived n=247	Not much n=361	No use at al n=221

from 17 randomized controlled trials from six countries.[15] The team set out to assess the effects of blue-light filtering lenses compared with non-blue-light filtering lenses for improving visual performance. Our result also collaborates with similar study available on literature search.[16] However, environmental conditions like use of air conditioner, sleep cycle, screen type like mobile, laptop, i-pad was not taken into account. Also, response of BLF spectacles in conjunction with other available treatment modality of CVS is to be reconsidered before coming to any conclusion.

5. Conclusion

Current century has witnessed surge in use of screen exposure, which brings with it an increase in health risks, especially for the eyes. The main causes of Computer Vision Syndrome include an unsuitable environment and the improper use of eyeglasses or contact lenses. Present study does not support the prescription of blue-light filtering lenses alone to reduce visual fatigue associated with computer use. A comprehensive treatment strategy delivered by eye care professionals is necessary for relief of symptoms of CVS. Large clinical research with longer follow-up needed to assess the potential effects of blue-light filtering spectacle lenses on visual performance.

6. Conflict of Interest

None.

7. Source of Funding

None.

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