

Our Patient's Eyes are Red: Is it Computer Vision Syndrome? (Computer Vision Syndrome)

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Abstract

A red eye is the most common ocular disorder that primary care physicians encounter. Redness also has a significant correlation with gadget use e.g. Computers. Computers are probably one of the biggest scientific inventions of the modern era and they have become an integral part of our life. The increased use of computers has led to variety of ocular symptoms which include redness, eyestrain, tired eyes, blurred vision and diplopia collectively referred as Computer Vision Syndrome (CVS). CVS may have a significant impact not only on visual comfort but also occupational productivity since between 64% and 90% of computer users experience visual symptoms after prolonged computer use.

Introduction

The generic name of 'Computer Vision Syndrome', is defined by the American Optometric Association as a complex of eye and vision problems related to the activities which stress the near vision and which are experienced in relation, or during the use of the computer.

Red eyes are commonly seen in patients with dry eyes. Dry eyes can happen when tears evaporate quickly or if the eyes produce too few tears. The eyes produce tears all the time. Healthy eyes are constantly covered with a fluid, known as tear film. It is designed to remain stable between each blink. This prevents the eyes

from becoming dry. Using of devices affects how we blink. Blinking is important because with every blink, your eyelids spread a fresh layer of tears across the surface of your eyes to keep them moist, comfortable and healthy. People typically don't blink their eyes normally when using a computer. Computer use affects both blink rate and blink completeness. One more additional factor is air conditioning system. It provides pleasant room temperature but makes the eyes dry out quickly. The type of dry eye caused by AC is evaporative dry eye.

Aetiology of Computer Vision Syndrome

It is difficult to point out a single aetiological factor which causes computer vision syndrome but it is a combination of several factors like prolonged working hours, inadequate rest breaks, constantly

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staring at a single screen source etc are some important causes of computer vision syndrome.

1. **LOW CONTRAST:** Studies have shown that the computer monitor is populated by tiny dots called pixels, the computer screen is difficult for the eye to focus on and these pixels are not uniformly bright and produce slight difference in contrast as a result of which even at high resolutions the edge of the letter looks fuzzy this adds to strain on eyes and is one of the important cause of computer vision syndrome.
2. **DURATION OF USE:** Most people work 6-7 hours a day. If you take a 1-hour lunch break it still leaves 3.5-4 hour periods during which you are staring at a computer screen. Extended viewing of a computer screen (over 2 hours) especially at a constant depth of field, is the primary cause of CVS.
3. **REDUCED BLINKING:** It has been observed that with prolonged use of the computers the blink rate reduces. The normal blink rate is about one to two dozen times a minute. Since blinking is important for hydration of eyes reducing blinking is also considered one of the causes of dry eyes and CVS.
4. **REDUCED EYE MOVEMENTS:** During activities in which they are focussed on a computer screen the eyes move through a lesser range of motion when concentrating on a screen. This reduction in eye movement serves to dehydrate the eye, which can, among other things lead to CVS.
5. **UNCORRECTED VISION PROBLEMS:**

Pre-existing uncorrected vision problems can increase the severity of computer vision syndrome. People who are prescribed eyeglass have to tilt their heads at odd angles because their glasses aren't designed for looking at a computer. They adopt postures to look at the computers which may not be ergonomically, correct. Such postures can result in muscle spasms or pain in the neck, shoulder or back.

Diagnosis of Computer Vision Syndrome

Computer vision syndrome can be diagnosed through a complete eye examination.

1. **PATIENT'S HISTORY:** This is taken to determine the underlying cause and understand the presence of any general health problems, medications taken, or environmental factors that may be contributing to the symptoms related to computer use.
2. **VISUAL ACUITY MEASUREMENTS:** Both distance and near vision is tested, to assess the extent to which vision may be affected. A refraction test is done to rectify the refractive errors, if any.
3. **ASSESSMENT OF CONVERGENCE and ACCOMMODATION:** There are numerous accommodative disorders (e.g. decreased amplitude of accommodation and binocular dysfunctions e.g. phorias, strabismus) that can clearly cause the symptoms. Improperly corrected presbyopia can also result in symptoms. Hyperopia can result in visual symptoms especially in near workers.

Treatment of Computer Vision Syndrome

1. **EYE CARE:** In some cases, individuals who do not require the use of eye glasses for other daily activities may benefit from glasses prescribed specifically for computer use. In addition, persons already wearing glasses may find their current prescription does not provide optimal vision for viewing a computer.
2. **PROBLEMS WITH FOCUSSING:** Some computer users experience problems with eye focusing or eye co-ordination. A programme of vision therapy may be needed to treat these specific problems. It trains the eye and brain to work together more effectively.
3. **IDEAL COMPUTER SCREEN POSITION:** It is of considerable importance, ideally it has been noted that computer screen which are 15 to 20 degrees below eye levels and which are kept at a distance of 20-28 inches from eyes provides greatest comfort. It is due to the fact that neck muscles are ideally relaxing in this posture.
4. **READING SOURCE:** The reading material required during computer usage should be ideally placed below the monitor and a document holder if available should be used, the goal is to position documents in such a way so as not to move your head between document reading and computer screen reading.
5. **LUBRICATING DROPS:** The most widely used therapy for dry eyes disease is tear replacement by topical use of artificial tears.
6. **ROOM ILLUMINATION:** It is essential to position all computer screens to avoid direct glare from lightning source. Usage of the lower wattage bulbs and proper fluorescence is an important factor in preventing computer vision syndrome. Anti-glare screens and filters can also effectively decrease the amount of light reflected from screen.
7. **THE REST PERIODS:** Every computer user should rest eyes in between when reading computers for prolonged durations. Rests in form of looking at distant objects for at least 20 seconds, frequent blinking in between and relaxing eyes for some time does a real benefit by relaxing accommodation and preventing CVS.
8. **THE BLINKING REFLEX:** Blinking is important because with every blink, your eyelids spread a fresh layer of tears across the surface of your eyes to keep them moist, comfortable and healthy. Unfortunately, people typically don't blink their eyes normally when using a computer. Computer affects both blink rate and blink completeness. So, blinking adequately is very essential.
9. **20-20-20 RULE:** Spending long periods looking at the computer, phone or tablet screen can strain the eyes. Using the 20-20-20 rule, can prevent this problem. The rule says that for every 20 minutes spent looking at a screen a person should look at something 20 feet away for 20 secs. During the break, the person focuses on an object 20 feet away which relaxes

the eye muscles.

References

1. Rosenfield M Computer vision syndrome: a review of ocular causes and potential treatments *Ophthalmic Physiol Opt* 2011 Sept.
2. Torrey Jon 'Understanding computer vision syndrome' *Employment Relations Today* 2003.
3. American Optometric Association <http://www.aoa.org/2012>. Anshel Jeffrey Computer Vision Syndrome: Causes and Cures *Managing Office Technology*, 1997.

Eliminating acute rheumatic fever and rheumatic heart disease

Importantly, acute rheumatic fever and rheumatic heart disease can be prevented by improvements in socioeconomic conditions and public health measures, including penicillin for streptococcal sore throat in endemic areas.

Magdi Yacoub, Bongani Mayasi, Ahmed ElGuindy, et al, The Lancet, 2017, Vol 390, 212

Towards therapeutic choices in ulcerative colitis

5-aminosalicylic acid has remained the mainstay of treatment in approximately half of patients, although several options are now available for those who become intolerant or refractory to this first line therapy. Beyond conventional treatments such as corticosteroids and thiopurines, antitumour necrosis factor (TNF?) blockers showed efficacy more than 10 years ago in patients with refractory ulcerative colitis.

Severine Vermeire and colleagues present results from a phase 2, randomised, double-blind, placebo-controlled trial (TURANDOT) that assessed the efficacy and safety of PF-00547659, a subcutaneous anti-MAdCAM fully human monoclonal antibody, in 357 patients with moderate to severe ulcerative colitis.

In TURANDOT, approximately half of patients had been previously treated with an anti-TNF? agent before inclusion.

In the coming years, physicians, treating patients with refractory ulcerative colitis will have several therapeutic options with multiple modes of action, including anti-TNF? blockers, anti-adhesion molecules, JAK inhibitors, sphingosine-1-phosphate modulators, and faecal microbiota transplantation. In parallel with Crohn's disease, the choice of the first line of biological agents in ulcerative colitis seems crucial.

David Laharie, The Lancet, 2017, Vol 390, 98-99