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REVIEW ARTICLE

Impact of computer use on children's vision

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Abstract

Today, millions of children use computers on a daily basis. Extensive viewing of the computer screen can lead to eye discomfort, fatigue, blurred vision and headaches, dry eyes and other symptoms of eyestrain. These symptoms may be caused by poor lighting, glare, an improper work station set-up, vision problems of which the person was not previously aware, or a combination of these factors. Children can experience many of the same symptoms related to computer use as adults. However, some unique aspects of how children use computers may make them more susceptible than adults to the development of these problems. In this study, the most common eye symptoms related to computer use in childhood, the possible causes and ways to avoid them are reviewed. Hippokratia 2009; 13 (4): 230-231

Key words: computer eye syndrome, dry eyes, childhood

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Initially, computers were used almost exclusively by adults. Today, millions of children use computers on a daily basis at school and at home, both for education and recreation. Although the visual impact of computer use has been studied in adults, only a few studies have investigated the same issue in children.

Children can experience many of the same symptoms related to computer use as by adults. Extensive viewing of the computer screen can lead to eye discomfort, fatigue, blurred vision and headaches, dry eyes and other symptoms of eyestrain. These symptoms may be caused by poor lighting, glare, an improper work station set-up, vision problems of which the person was not previously aware, or a combination of these factors. In most cases, symptoms occur because the visual demands of the task exceed the visual abilities of the individual to comfortably perform the task[1,2]. However, some unique aspects of how children use computers may make them more susceptible than adults to the development of these problems.

The limited degree of self-awareness of children

Most of them keep performing an enjoyable task (e.g. playing video games) with great concentration, for many hours, until exhaustion, with few, if any, breaks. Prolonged activity without a significant break can cause accommodative problems and eye irritation. Accommodative problems may occur as a result of the eyes' focusing system "locking in" to a particular target distance. In some cases, this may cause accommodation spasm[1].

Eye irritation may occur because of poor tear distribution over the eye due to reduced blinking. Blinking is often inhibited by concentration and staring at a computer or video screen. Compounding this, computers usually are located higher in the field of view than traditional paperwork. This results in the upper eyelids being retracted to a greater extent. Therefore, the eye tends to experience more than the normal amount of tear evaporation resulting in dryness and irritation[1-3].

The adaptability of children

Although there are many positive aspects to their adaptability, children frequently ignore problems. A child who is viewing a computer screen with a large amount of glare often will not think about changing the computer arrangement or the surroundings to achieve more comfortable viewing. This can result in excessive eye strain. Also, children often accept blurred vision caused by a refractive error, because they think everyone sees the way they do. Uncorrected hyperopia can cause eye strain, even when clear vision can be maintained.

The use of an adult computer

Since most computer workstations are arranged for adult use, computers do not fit them well. Therefore, a child using a computer on a typical office desk often must look up further than an adult. Since the most efficient viewing angle is slightly downward about 15 degrees, problems with binocular vision can occur. In addition, children may have difficulty reaching the keyboard or placing their feet on the floor, causing arm, neck or back discomfort.

The non optimum lighting

The lighting level for the proper use of a computer is about half as bright as that normally found in a classroom. Increased light levels can contribute to excessive glare and problems associated with adjustments of the eye to different levels of light.

Points to consider for children using a computer[3-5]:

• **An eye examination.** This makes sure that the child can see clearly and comfortably. For regular computer users, at least an annual eye examination is required. When necessary, refractive correction and / or orthoptic exercises (eg. in convergence insuffiency), should be provided.

• **Reduction of the amount of time that a child can continuously use the computer.**

A ten-minute break for every hour work, will minimize the development of accommodative problems and eye irritation.

• **Carefully check the position of the computer.**

The computer monitor and the keyboard are positioned and adjusted according to child's body parameters. The screen should not be positioned in a too high level in the child's field of view; the chair should not be positioned in too low level and the desk not in a too high level. An adjustable chair is a good solution. A foot stool may be necessary to support the child's feet.

• **Carefully check the lighting for glare on the computer screen.**

Windows or other light sources could create glare on the screen. When this occurs, the desk or the computer screen should be turned to another direction.

• **Reduce the amount of lighting in the room.**

In some cases, a dimmer light is preferred instead of the bright overhead light.

Children have different needs to comfortably use a computer. A small amount of effort for precautions can help to reinforce the appropriate viewing habits and assure comfortable and enjoyable computer use.

References

1. Barar A, Apatachioaie ID, Apatachioaie C, Marceanu-Brasov L. Ophthalmologist and computer vision syndrome. Oftalmologia. 2007; 51: 104-109.
2. Bali J, Navín N, Thakur BR. Computer vision syndrome: a study of the knowledge, attitudes and practices in Indian ophthalmologists. Indian J Ophthalmol. 2007; 55: 289-294.
3. Izquierdo JC, Garcva M, Buxó C, Izquierdo NJ. Factors leading to the Computer Vision Syndrome: an issue at the contemporary workplace. Bol Asoc Med P R. 2004; 96: 103-110.
4. Blehm C, Vishnu S, Khattak A, Mitra S, Yee RW. Computer vision syndrome: a review. Surv Ophthalmol. 2005; 50: 253-262.
5. Akhmadeev RR, Aznabaev MT, Surkova VK, Sagadatova NM. Visual functions in personal computer users: ophthalmic-ergonomic aspects. Vestn Oftalmol. 2001; 117: 52-54.