INTRODUCTION

In previous generations, when survival depended on the ability to hunt, fish, and farm, the visual system had to respond to constantly changing, distant stimuli. Good distance visual acuity and stereoscopic vision were of paramount importance. Today, the emphasis has shifted from distance to two-dimensional near vision tasks such as reading, desk work, and computer viewing. In some persons, the visual system is incapable of performing these types of activities efficiently either because these tasks lack the stereoscopic cues required for accurate vergence responses or because the tasks require accommodative and vergence functioning that is accurate and sustained without fatigue. When persons who lack appropriate vergence or accommodative abilities try to accomplish near vision tasks, they may develop ocular discomfort or become fatigued, further reducing visual performance ***(Schachar, 2008).***

Accommodative and vergence dysfunctions are diverse visual anomalies. Any of these dysfunctions can interfere with a child's school performance, prevent an athlete from performing at his or her highest level of ability, or impair one's ability to function efficiently at work ***(Worgul, 2006)***.

Those persons who perform considerable amounts of close work or reading, or who use computers extensively, are more prone to develop signs and symptoms related to accommodative or vergence dysfunction ***(Hoffman, 2008)***.

Symptoms commonly associated with accommodative and vergence anomalies include blurred vision, headache, ocular discomfort,

ocular or systemic fatigue, diplopia, motion sickness, and loss of concentration during a task performance. The prevalence of accommodative and vergence disorders, combined with their impact on everyday activities, makes this a significant area of concern ***(*Kragha, 2004).**

An accommodative or vergence dysfunction can have a negative effect on a child's school performance, especially after third grade when the child must read smaller print and reading demands increase. Due to discomfort, the child may not be able to complete reading or homework assignments and may be easily distracted or inattentive. Such children may not report symptoms of asthenopia because they do not realize that they should be able to read comfortably. The clinician should suspect Accommodative and Vergence Dysfunction binocular or accommodative problem in any child whose school performance drops around third grade or who is described as inattentive ***(Duke-Elder, 2000)***.

Many children who have reading problems or who are learning disabled or dyslexic have accommodative and vergence problems. Even if one of these ocular conditions is not the primary factor in poor academic performance, it can contribute to a child's difficulty with school work; therefore, any child who is having academic problems should have a comprehensive optometric examination. If indicated by signs or symptoms, optometric vision therapy to improve accommodative and binocular skills may enable the child to perform near tasks more comfortably and benefit more effectively from educational remediation ***(*Goldstein, Schneekloth, 1996)**

Good binocular skills contribute to better athletic performance. Sports such as basketball, baseball, and tennis require accurate depth

perception, which in turn depends upon good binocularity. Studies show that tennis players have significantly lower amounts of and more stable heterophoria than nonathletes and those varsity college athletes have better depth perception than nonathletes ***(Copper, 2007)***.

The increased use of computers in the workplace, and in schools, has focused attention on the impact of binocular vision dysfunction on both performance and comfort. A high percentage of symptomatic computer workers have binocular vision problems and ocular discomfort increases with the extent of computer use.8-10 Similar findings are reported for other populations who perform sustained near work, such as students, accountants, and lawyers. Asthenopia associated with sustained near work can usually be eliminated with proper lens correction or vision therapy to improve accommodative-convergence function ***(Schachar, 2008)***.

The term spasm of accommodation means condition in which the ciliary muscle of the eye remains in a constant state of contraction. Normally, this contraction bends the lens to allow the eye to accommodate for near-vision. However in a state of perpetual contraction, the ciliary muscle cannot relax when viewing a distant object which leads to vision to blur when attempting to view objects from a distance .This may be caused by pseudo-myopia or latent hyperopia ***(Von-Helmholtz, 2002)***.

Although antimuscarinic drops can be applied topically to relax the muscle, excessive pupil dilatation may occur as an unwanted side effect. The dilatation may pose a problem since it could allow an increased amount of harmful ultraviolet light to enter and damage the eye.

Ourunderstanding of the etiology of spasm of accommodation is derived principally from our understanding of definition of accommodation and mechanism of accommodation ***(Roger,1997)***.

Accommodation is a complex constellation of sensory, neuromuscular, and biophysical phenomena by which the overall refracting power of the eye changes rapidly to image objects at distances clearly on the retina .In the abstract one can envision a variety of optical strategies for accomplishing this task:

1- Changing the corneal curvature.

2- Changing the distance between the cornea and retina.

3- Placing another lens system between the cornea whose effective refracting power can be varied by changing its surface curvatures or its position within the globe.

4- Changing the index of refraction of one or more components of ocular media.

5- Having two or many separate optical pathways of different refracting power ***(Roger, 1997)***.

Accommodation

The emmetropic eye is defined as the eye whose optical system is bringing the images of distant objects to be focused on the retina, which is considered the second principal focus of the dioptric system. Images of near objects will necessarily be formed behind the retina and to bring them to be focused on the retina an increase in dioptric power is necessary, and this increase is described as accommodation. ***(Scarchar, 2008)***.