



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

ASTHENOPIA - AN OVERVIEW

Mr. Muhammed Jaseem A

Principal, Itees College of Health Sciences, Malappuram, Kerala, India.

Abstract: Asthenopia is an ocular condition where the patient feels his eyes tired. Mild cases of asthenopia can treat by giving rest to eyes. But moderate - severe cases of asthenopia may be the indication of some serious health issues. The reasons of asthenopia are countless. The major objective of this study is to understand the common causes, symptoms, management and differential diagnosis of asthenopia.

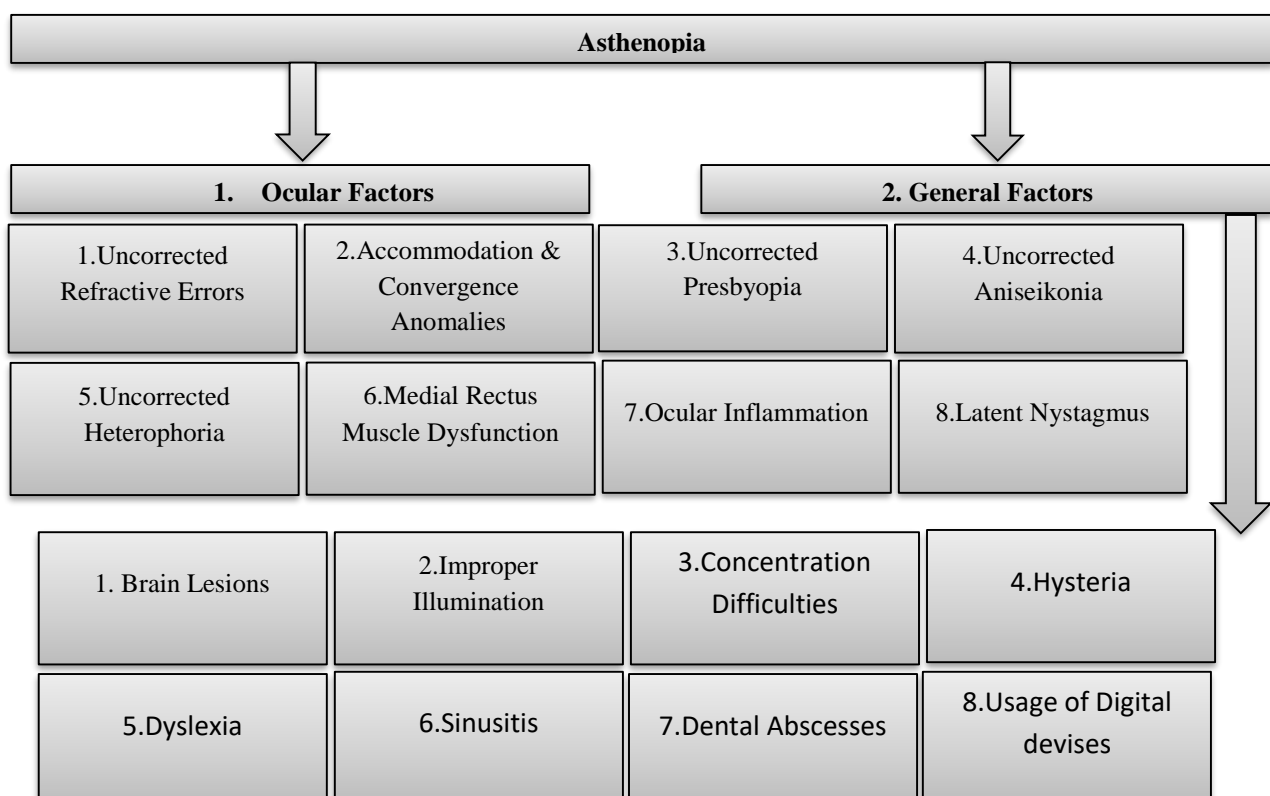
KEY WORDS: Causes of Asthenopia, Symptoms of Asthenopia, Management of Asthenopia, Differential Diagnosis of Asthenopia.

I. INTRODUCTION

Asthenopia is an ocular condition where the eyes are getting tired or strained due to some ophthalmic non ophthalmic reasons. Asthenopia can simply termed as Eye strain. The word asthenopia originated from the Greek word *a-sthen-opia* which means the weak eye conditions. Asthenopia occurs due to prolonged use of eye and brain which leads to strain in ciliary, intra-extra ocular muscles. This turned to tired/discomfort on the eye ball. Most of the general and ocular illness leads to asthenopia. Here we can discuss briefly about causes, symptoms, management and differential diagnosis of asthenopia.

II. CAUSES OF ASTHENOPIA

The causes of asthenopia can be categorized as two factors, ocular and general. They are,



1. OCULAR FACTORS

1.1 Uncorrected Refractive Errors:

Even the small degree of refractive errors may cause asthenopia. In this condition, the patient is needed to exert more muscular effort to compensate the errors and this makes asthenopia. The uncorrected refractive errors can be further divided in to following:-

- a- Uncorrected Myopia: Myopia is a refractive error condition where the parallel coming from infinity will focus in front of retina, when the accommodation is at rest. In such conditions, the patient can see the near objects very clearly. Blurring occurs when the patient is held his reading material beyond his far point. Thus, the patient is needed to keep bit closer for a better clarity. This leads to convergence over action and this owing to asthenopia.
- b- Uncorrected Hypermetropia: Hypermetropia is a refractive error condition where the parallel coming from infinity will focus behind the retina, when the accommodation is at rest. In such conditions, the patient can see the distant objects very clearly. Accordingly blurring occurs for near. To compensate this, more usage of ciliary muscle and thus leads to asthenopia.
- c- Uncorrected Astigmatism: Astigmatism is a refractive error condition where the parallel coming from infinity will not be focus to a single point at retina but forms focal lines. This is the one of the commonest cause of asthenopia due to refractive error. Here, the patient fails to focus an object and takes more effort to clear the image. Symptoms are more severe in hypermetropic astigmatism than myopic where the accommodation makes more effort to compensate hypermetropia.
- d- Uncorrected Anisometropia: Anisometropia is also a refractive condition where unequal refractive error will be there in two eyes. Here, the patient perceives blurred images in both eyes. To compensate this takes more effort and thus leads to asthenopia.

1.2 Accommodation & Convergence Anomalies:

Accommodation is the ability of the eye to focus in distinct regional objects. Convergence is the rotation of both eyes inward to intersect the line of sight of eye. Anomalies in accommodation and convergence will leads to asthenopia. Anomalies of accommodation and convergence can be further classified in to following:

- a- Insufficiency of Accommodation: The term used when accommodative power is less than the normal physiological limits with patient age. In this condition, the patient tries to exert more accommodation for near work. This causes to asthenopia.
- b- Ill Sustained Accommodation: In this condition, accommodation facility is normal but can't sustain over a period of time. Here also the patient tries to exert more accommodation and thus to asthenopia.
- c- Inertia of Accommodation: This term used when the patient seems difficulty to adjust the accommodation to different distances. As said before patient tries to get in focus and this makes asthenopia.
- d- Paralysis of Accommodation: This condition refers when the complete absence of accommodation occurs. As said before patient tries to get in focus and this makes asthenopia.
- e- Excessive Accommodation: Here, the patient exerts more accommodation to perform near work. Over usage of ciliary muscles and convergence thus leads to asthenopia.
- f- Convergence Insufficiency: It is the inability of the eyes to obtain adequate binocular convergence when looking at nearby objects. Convergence Insufficiency is the most common cause of asthenopia.in such cases the near point of convergence (NPC) is increased from normal baseline. It's more common in the patient associated with accommodation insufficiency and this is the commonest reason for asthenopia in children/youngsters. Asthenopia occurs due to difficulty in attaining the convergence of 30 degree. General debility illness and diseases are the other cause of convergence insufficiency.
- g- Convergence Paralysis: This condition refers when the complete absence of convergence occurs. As said before patient tries to converge both eyes to get an alignment with objects and this makes asthenopia.
- h- Convergence Spasm: This term refers to the condition where the convergence occurs only intermittently. This condition comes in association with accommodation spasm and patient with miosis.

1.3 Uncorrected Presbyopia:

Presbyopia is not a refractive error but is a physiological insufficiency of accommodation .It is associated with age which results in progressively failing to focus the near objects. Generally the presbyopia occurs after 40 years of age. Here the patient is trying to focus near object this turns to ciliary muscle over tension and this leads to asthenopia.

1.4 Uncorrected Aniseikonia:

Aniseikonia is a binocular anomaly where the binocular images are unequal in size or shape or both. Small amount of aniseikonia will make asthenopia due to tiredness of muscle while try to make the size in same way.

1.5 Uncorrected Heretophoria:

Heterophoria is a condition where the tendency of the eyes to deviate is kept by fusion. Heretophoria is also known as latent squint / latent strabismus. Heterophoria can be divided in to five: Esophoria, Exophoria, Hyperphoria, Hypophoria and Cyclophoria. Once the fusion interrupted in any cases, the deviation of eyes occurs. This binocular interruption will leads to asthenopia.

1.6 Medial Rectus Muscle Dysfunction:

The dysfunction of medial rectus muscle is due to sixth nerve palsy. The common symptom of sixth nerve palsy is diplopia. This diplopia makes asthenopia when the patient tries to focus the objects as single.

1.7 Ocular Inflammation:

Inflammation in the ocular structures produces asthenopia. Most of the inflammations of eyes produce asthenopia and it is great concern while associated with life style diseases such as thyroid & hypertension. Hypothyroidism produces more asthenopia symptoms than hyperthyroidism.

1.8 Latent Nystagmus:

Latent Nystagmus is movement of the eyes to fixate the object. It is often seen in the patient with esotropias such as congenital esotropia and infantile esotropia. Nystagmus results from abnormal binocular interaction. This binocular interaction owing to asthenopia.

2. GENERAL FACTORS

2.1 Brain lesion:

Any kind of brain lesion makes asthenopia. The main causes of brain lesion are trauma, inflammation in brain cells, autoimmune diseases, multiple sclerosis, stroke and tumors.

2.2 Improper Illumination:

Improper illumination is the one of the temporary cause of asthenopia. The prolonged use of work in improper illumination leads to severe asthenopia in the form of dryness or discomfort in or around the eye. This may due to the improper distribution of light /contrast.

2.3 Concentration Difficulties:

Concentration difficulties may makes asthenopia. These difficulties may arise from some brain concussions or by sleep deprivation or by depression.

2.4 Hysteria:

Hysteria is the psychogenic involuntary action which leads to uncontrollable outburst of emotions. Mostly it is associated with illness anxiety disorders or other psychotic disorders. This uncontrollable emotions leads to asthenopia.

2.5 Dyslexia:

Dyslexia is a learning disorder that involves the difficulty to read, write, spell and speak. Dyslexia is more prone in children where he cannot able to spell the letters in words/sentence.

2.6 Sinusitis:

Sinusitis is the inflammation of sinus tissues. Symptoms of sinusitis are cough, fever, nasal discharge, halitosis, etc. Asthenopic symptoms are more often in sinusitis as like other mentioned symptoms.

2.7 Dental Abscesses:

Dental abscesses are the formation of puss in teeth or gum which is caused by oral inflammation. And this occurs as a complication of dental caries, tooth extractions/tooth maintenance procedures. Palpating of teeth with tongue leads to asthenopia.

2.8 Usage of Digital Devices:

The prolonged use of digital devices such as cell phones, tablets, computers, etc. will cause the tension in various part of the body. It seems most often in or around the eye and in neck and back muscles. This is mainly due to lack of rest to the body. Eye stains due to such devices are simply termed as Digital Eye Strain. Computer Vision Syndrome (CVS) is a part of digital eye strain.

III. SYMPTOMS OF ASTHENOPIA

Symptoms of asthenopia may be in the form of,

Head Ache	Eye Pain	Eye Strain	Tickling	Itching
Burning	Blurred Vision	Double Vision	Squinting of Eyes	Soreness
Photophobia	Dryness	Nausea	Dizziness	Tiredness in Eyes

IV. MANAGEMENT OF ASTHENOPIA

Management of asthenopia includes the management of cause of asthenopia. General health status of the patient also is concerned.

- Management of uncorrected refractive errors, accommodation - convergence anomalies, uncorrected presbyopia, uncorrected aniseikonia, and uncorrected heterophoria are by clear cut evaluation. Prescribe the spectacles or relevant devices/ exercises (in proper prescribed manner) after the evaluation. Orthoptic exercises play an important role in accommodation-convergence anomalies especially in convergence insufficiency. Along with that in heterophorias, some orthoptic exercises aimed to improve the amplitude of fusion vergence. Base in prisms are prescribed occasionally for convergence insufficiency once the orthoptic exercises fails.
- Management of medial rectus muscle dysfunction can do only by the basis of its severity.
 - If it is at mild phase, the various management methods are following:-
 - Advise the patient to alternate occlusion to avoid diplopia.
 - Inject the Botulinum Toxin injection to minimize antagonist muscle contraction.
 - If it is at severer phase, the various management methods are following:-
 - Prescribe the prism incorporated spectacles to relieve diplopia.
 - If the prism cannot be tolerated, then the surgery is advised. The main objective of the surgery is to obtain optimum ocular alignment in primary gaze.
- Management of ocular inflammation is to manage the cause of inflammation. Management includes the examination of inflammation and prescribes the medicines needed.
- Latent Nystagmus can be treated by correcting the refractive error if it is significantly low especially in the case of unilateral aphakia.
 - Overcorrection in minus lens may prescribe to improve the distance visual acuity and reduce the Nystagmus.
 - Prism therapy also effective in such nystagmus cases.
 - Some ophthalmic medicines or injections such as Cyclopentolate and Botulinum Toxin are prescribed to reduce the Nystagmus.
 - If the prism cannot be tolerated, then the surgery is advised. The main indication of surgery is by shifting the null point for both with or without abnormal head posture cases.
- Management of brain lesions, concentration disorders, sinusitis and dental abscesses by prescribe the medicine, monitor the patient in regular interval and alter the medicine/method if needed.
- The main goal of management of hysteria and dyslexia is to motivate the patient rather than medicine prescription especially in dyslexia. The continues training is need for such conditions.
- Management of usage of digital device can be done by following methods:-
 - 20-20-20 Rule. This rule says that after the 20 minutes usage of device you should look at 20 feet way object for least 20 seconds.
 - Perform eye stress relieving exercises and palming. In palming, warm the palms then cup them over they eyes. The eyes should close in such therapy.
 - Use artificial tear drops/gels if the dryness is in high level. This can uses device prolonged users.
 - Maintain the sitting position properly especially in computer vision syndrome condition.
 - Use the vitamin medicines which should prescribed by medical practitioners
 - Use Blue cut-Anti reflection coating in both screens & spectacles
 - Voluntary blink mechanism is good for such cases.

V. DIFFERENTIAL DIAGNOSIS OF ASTHENOPIA

1. Migraine:

Migraine is also a type of head ache where the dizziness and nausea is more often than asthenopia. These are long term head ache affects in a part of head which will not be relaxed by rest.

2. Tension Head Ache:

In this condition the patient feels a pressure on forehead or in back of the head. The pain killers are needed in most cases to get rid from head ache.

3. Fatigue:

Sleep Deprivation or exhaustion to wind, heat, etc. may leads to tiredness of body and eye. This can relieved by taking rest/sleep.

VI. CONCLUSION

Asthenopia may be an indication of any health issues. Most of the practitioners are neglecting asthenopia nowadays. Proper treatment and counseling are plays very important role to relieve the patient completely from asthenopia.

REFERENCES

- [1] Troy Bedinghaus. (2020), An Overview of Eye Strain (Asthenopia), Verywell health.com.
- [2] Daniel B. Heir. (1897), Disorders of Affect and Emotion, ScienceDirect.com.
- [3] Amita Shroff. (2021), What is Dyslexia, Web MD.com .
- [4] Smitha KV. (2012), Asthenopia. Kerala Journal of Ophthalmology, Vol.XXIV No.1.
- [5] AK Khurana, Theory & Practice of Optics & Refraction, Fourth edition.
- [6] AK Khurana, Theory & Practice of Squint & Orthoptics, Second edition.

