



Original Article

Frequency of presenting clinical features of asthenopia (ocular fatigue) in refractive patients.

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Purpose: Asthenopia is tiredness, uncomfortable, ocular fatigue, decreased reading ability, blurred vision diplopia, irritation pain in and around the eye. The presence of one or more of these subjective symptoms that occur in subject with uncorrected refractive error or lowered amplitude of accommodation or muscle movement defect are considered as asthenopia.

Objective: To find out the frequency of presenting clinical features of asthenopia.

Patients and Methods: Patients were selected from Mayo Hospital Lahore and College of Ophthalmology and Allied Vision Science, Lahore. Data were collected after informed consent from patients and I used a structured questionnaire with 11 multiple choice questions administered to all 30 patients of refractive error. All patients were examined according to the proforma. NPA & NPC were examined using RAF rule method. Visual acuity was measured and best correction were provided to all patients.

Results: Out of the 30 patients 17(56.67%) were males and 13(43.33%) were females. Mean age of the patients was 36.57 years. Almost every patient presented with more than one complaint. Most frequent asthenopic symptoms were headache 28(93%), blurred vision 27(90%), Discomfort 27(90%) tiredness of eye 21(70%), Slowness of focus 23(78%). Less frequent symptoms reported by subjects with refractive error was burning eye (13%) neck pain (23%) diplopia (20%) back pain (6.7%). All refractive errors were in moderate to severe range, out of 30 patients' 66.7% were in severe range and 33.3% in moderate range. 23.7% patients were myopic, (46.7%) were hypermetropic, 6.7% were astigmatic, 10.0% were anisometropia and 13.3% were presbyopic.

Conclusion: Headache and blurry vision were the most common complaints among subjects who participated in this study.



Introduction

Asthenopia is a symptom that is nearly synonymous with the term eye strain. Asthenopia is a very common symptom reported by occupational computer workers students and secretaries, accountants, bookkeepers, draftsmen, tailors, writers and individual who perform near visual task for prolonged duration of time. The symptomatology of asthenopia is characterized by ocular fatigue, blurred vision, itching in and around the eye, difficult reading, frontal and occipital headache, diplopia, pain inside or behind the eye, burning or tears in the eye, dryness, irritability, gritty or pulling sensation of the eyes. Eyelids appear heavy, sleepiness, poor or even loss of concentration, possible lowered depth perception, motion/car sickness, nausea, and general fatigue induced by overuse of visual display terminals. These symptoms may be associated with decreased ability of accommodation and vergence.¹⁻³

The presence of these symptoms is collectively called computer acquired vision syndrome or may be termed Asthenopia (eyestrain).⁴ Its etiology and pathophysiology is not yet well known. However, it may be connected to uncorrected refractive errors, such as uncorrected myopia may develop an accommodative response and patient may need to approximate the objects closer to the eye to make it comfortable for reading and this approximation of object closer to the eye needs more convergence for single vision resulting Asthenopia.

In hypermetropia, patient becomes asthenopic because of increased refractive power of the eye by repeated stimuli of ciliary muscle during near work. Uncorrected astigmatism also results in asthenopic symptoms. However, the effect of asthenopic symptoms increase in hypermetropic astigmatism because of increased accommodative effort in order to overcome hypermetropia. Uncorrected anisometropia develops asthenopia because of unequal accommodation in both eyes. Wrongly prescribed glasses, or binocular dysfunctions such as accommodative dysfunctions and vergence dysfunctions also results in asthenopia.

Accommodative dysfunctions may be due to accommodative insufficiency, ill-sustained accommodation, accommodative insufficiency, paralysis of accommodation or spasm of accommodation. Vergence dysfunction may occur due to convergence insufficiency, convergence excess, divergence insufficiency, basic esophoria, fusional vergence dysfunction, basic esophoria or vertical phoria.⁵⁻⁸ Discomfort may be due to glare. The major cause is age-acquired presbyopia. Poor contrasting sensitivity or poor image quality may also cause asthenopia. Computer display terminals, squinting of eyes, lid problems and dry eyes are other causes of asthenopia.²

Symptoms of asthenopia are classified in two types according to Sheedy; internal symptoms and external symptoms. The internal symptoms include feeling of muscle strain and ache, itching inside the eye while reading or near work, it may also occur in patients with uncorrected refractive errors such as hyperopia, astigmatism or unsuitable prescription given to the patient. This may also be induced by accommodative and convergence insufficiency. *Reading through alternate plus and minus lenses respectively produces internal symptoms. External symptoms include the feeling of burning, dryness, and irritation on ocular surface* when reading in the presence of glare or when reading poor quality print. The external symptoms of asthenopia is like dry eye symptoms and its important elements of Asthenopia in subjects working on computers and screens. This leads to lower blinking rate and cause dry eye, the symptoms associated with excessive use computer work.⁹

A study has shown that headache, eye ache and blurry vision was the most frequent of asthenopic symptoms and it was also found that the refractive error was the most frequent findings of asthenopia followed by convergence insufficiency and latent squint in presbyopic patients.¹² Another study has also found that the headache was most frequent symptoms of asthenopia reported by refractive subjects specially those having astigmatism.¹³

To prevent Asthenopia symptoms (ocular fatigue) one should take precautions and be aware of the risk factors that can cause Asthenopia and educating people who are at greater risk for developing eyestrain and how to eliminate the symptoms.¹⁴ People in occupation such as bank workers and mobile repairers should be educated to set their ergonomical position, have proper lighting situation for their place of works to avoid glare and advise them to blink after sometime as blinking reduces the asthenopia and gives comfortable vision and have look away from screen for sometime usually about after 20 to 30 of computer uses. The practitioners should provide good and accurate correction for all patients with uncorrected refractive error to eliminate the symptoms of ocular fatigue. Proper hygiene of computer screen is also important.¹⁵

Patients and Methods

It was a comparative study based on 30 individuals who were either emmetrope or were having some refractive errors. Refraction was done and Results were obtained by asking the patient to fill a structured proforma.

Results

Total 30 individuals were interviewed. The age ranged from 16 to 65 years. The most frequent ages were 22 (10%), 24 (10%) and 51 (10%). Seventeen males (57%) and

13 (43%) females with refractive errors (Table 3). Out of 30 patients, 66.67% response was severe and 33.33% response was moderate in intensity.

Table. 1

Gender * Refractive Error			
Gender	Male	Female	Total
Myopia	7	0	7
Hypermetropia	2	12	14
Astigmatism	2	0	2
Anisometropia	3	0	3
Presbyopia	3	1	4
Total	17	13	30

Figure-1: shows significant distribution of headache in refractive subjects suffering from asthenopic and large number of distribution is in hypermetropia and myopia.

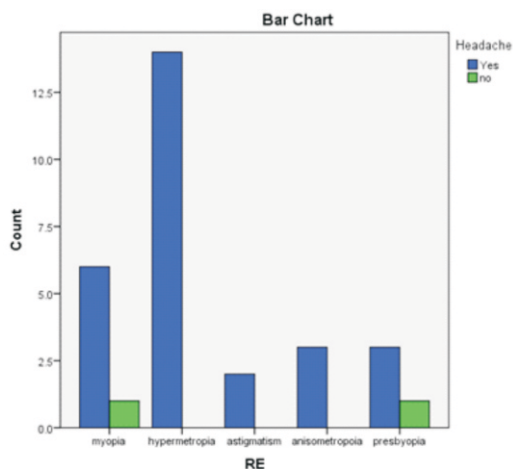


Figure-2. shows the distribution of blurry vision in refractive subjects complaining with asthenopia. Hypermetropic patients complaining blurry vision were 14 (51.9%) and among myopia 7 patients (25.9%) and 2 patients (7.4%) were astigmatic patients and 2 patients (14.8%) were presbyopic patients experiencing blurry vision while anisometropic patients have no significant report on blurry vision.

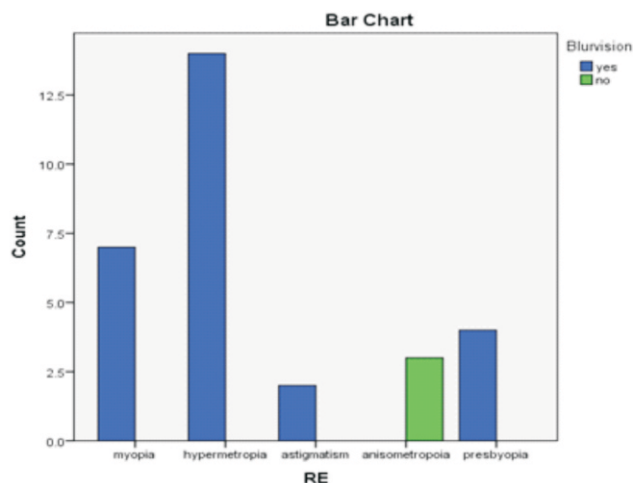


Table 2 shows the issue of delayed focusing was present in 21 patients (70%); 4.8% were myopic, 19.0% were presbyopic, 9.5% were astigmatic and 66.7% were hypermetropic patients. 52.4% hypermetropic patients suffered from tired eyes. Astigmatics and myopes showed same response of tired eyes (9.5%). Presbyopic and anisometropic patients' response was also same for tired eyes (14.35% each). 50.0% of burning eye is reported by hypermetropic patients and 25.0% of burning eye were reported by presbyopic and anisometropic patients while myopic and astigmatic patients were not experiencing any eye burning sensation.

35.7% of hypermetropic patients had itching sensation. 21.4% of Myopic, presbyopic and anisometropic patients suffered from itching sensation. None of the astigmatic had itching sensation. The frequency table and crosstab show 40% in presbyopic and 30% hypermetropia and myopic patients suffer itching while anisometropia and astigmatism patients have not experienced itching. 30.4% of myopic, 39.1% hypermetropic, 8.7% astigmatic, 4.3% anisometropic, and 17.4% of presbyopic patients were complaining eye pain. 90% of all patients with uncorrected refractive error were complaining discomfort. The above table shows that significant association of diplopia in uncorrected myopic patients than the other uncorrected refractive error patients. There is significant association of watering eye in astigmatic, myopic and hypermetropic uncorrected refractive error. 23% seven patients were complaining neck pain and most of them were hypermetropic. There is no association of dry eye in all patients with refractive error. Similarly, there was no association of dizziness in any patient with refractive error.

Table 2. Frequency distribution of ocular complaints among refractive subjects:

Findings		Myopia		Hypermetropia		Astigmatism		Anisometropia		Presbyopia		Total	
		Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Headache	Yes	6	20%	14	47%	2	7%	3	10%	3	10%	28	93%
	No	1	3%	0	0%	0	0%	0	0%	1	3%	2	7%
Blur vision	Yes	7	23%	14	47%	2	7%	0	0%	4	13%	27	90%
	No	0	0%	0	0%	0	0%	3	10%	0	0%	3	10%
Delayed focus	Yes	1	3%	14	47%	2	7%	0	0%	4	13%	21	70%
	No	6	20%	0	0%	0	0%	3	10%	0	0%	9	30%
Tiredness of eye	Yes	2	7%	11	37%	2	7%	3	10%	3	10%	21	70%
	No	5	17%	3	10%	0	0%	0	0%	1	3%	9	30%
Burning	Yes	0	0%	2	7%	0	0%	1	3%	1	3%	4	13%
	No	7	23%	12	40%	2	7%	2	7%	3	10%	26	87%
Itching	Yes	3	10%	5	17%	0	0%	3	10%	3	10%	14	47%
	No	4	13%	9	30%	2	7%	0	0%	1	3%	16	53%
Irritation	Yes	3	10%	3	10%	0	0%	0	0%	4	13%	10	33%
	No	4	13%	11	37%	2	7%	3	10%	0	0%	20	67%
Pain	Yes	7	23%	9	30%	2	7%	1	3%	4	13%	23	77%
	No	0	0%	5	17%	0	0%	2	7%	0	0%	7	23%
Discomfort	Yes	7	23%	14	47%	2	7%	0	0%	4	13%	27	90%
	No	0	0%	0	0%	0	0%	3	10%	0	0%	3	10%
Diplopia	Yes	5	17%	0	0%	0	0%	0	0%	1	3%	6	20%
	No	2	7%	14	47%	2	7%	3	10%	3	10%	24	80%
Watering	Yes	6	20%	6	20%	2	7%	0	0%	0	0%	14	47%
	No	1	3%	8	27%	0	0%	3	10%	4	13%	16	53%
Neck pain	Yes	2	7%	5	17%	0	0%	0	0%	0	0%	7	23%
	No	5	17%	9	30%	2	7%	3	10%	4	13%	23	77%
Dry eye	No	7	23%	14	47%	2	7%	3	10%	4	13%	30	100%
Dizziness	No	7	23%	14	47%	2	7%	3	10%	4	13%	30	100%
Total		7	23%	14	47%	2	7%	3	10%	4	13%	30	100%

Table 3. Near Point of Accommodation

NPA (mm)	Myopia	Hyperopia	Astigmatism	Anisometropia	Presbyopia	Total
11-15	3	0	0	0	0	3
16-20	3	2	0	1	2	8
21-25	0	0	0	0	0	0
26-30	1	5	0	1	0	7
31-35	0	3	0	0	0	3
36-40	1	3	1	0	0	5
41-45	0	0	1	0	1	2
46-50	0	0	0	1	0	1
51-55	0	0	0	0	0	0
56-60	0	1	0	0	0	1
Total	8	14	2	3	3	30

Table 3 shows normal NPC in myopic patients and increase in NPC gradually in hypermetropic and astigmatic patients while the anisometropic and presbyopia patients shows different value of NPC.

Table 4: Near Point Convergence

NPC (mm)	Myopia	Hyperopia	Astigmatism	Anisometropia	Presbyopia	Total
5-10	5	0	0	1	1	7
11-15	2	5	0	1	1	9
16-20	0	4	0	0	0	4
21-25	1	4	1	0	0	6
26-30	0	1	1	1	1	4
Total	8	14	2	3	3	30

Table 4 shows normal NPC in myopic patients. NPC increased gradually in hypermetropic and astigmatic patients while the anisometropic and presbyopia patients shows abnormal values of NPC.

Conclusion

Headache and blurry vision were the most common complaints among subjects who participated in this study. The level of response to asthenopic symptoms reported by female patients with hypermetropia was severe as compared to other refractive subjects. The near point accommodation (NPA) and near point convergence (NPC) in hyperopes were significantly insufficient than normal range. Uncorrected refractive errors caused significant asthenopic symptoms. All patients with uncorrected refractive errors should be informed to correct their refractive errors in order to avoid asthenopic

symptoms. This should be done through media, awareness programs in public places or through seminars.

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