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Level of Comfort in Near Work with and without Glasses In Relation to Amount of Myopia

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Objectives: To find the effect of degree of myopia on reading distance and to compare the comfort level in normal adults at near with and without myopic correction.

Method: It was comparative cross sectional study, conducted on three hundred and fifty eight myopes having different degree of myopia aged between 15 to 60 years. Comfort level at near with and without spectacles in different degree of myopia was assessed by filling a self-structured proforma and questionnaire.

Results: Sixty five percent of all mild myopic spent most of their time while 51% of all subjects having moderate and 72% of all having severe myopia spent <2 hours during near work without glasses. Majority of subjects with mild, moderate and severe degree of myopia had 40cm, 25cm and less than 25cm working distance respectively. 70% of all mild myopic were not having headach while 37% of all with moderate very often and 72% of all individuals having severe myopia were suffering from headache without glasses during near work. 80% of all mild myopic, 37% with moderate myopia were not having, while 81% of all individuals with severe myopia were suffering from eyestrain without glasses at 33cm. 80% of all mild myopic had no difficulty while 47% of all moderate myopes and 89% of all with severe myopia had difficulty in focusing near objects without spectacles, p value of all results is .001.

Conclusion: It is concluded that mild myopes are more comfortable without glasses while individuals with severe myopia are more comfortable with glasses at near (33cm).On the other hand moderate myopes use their spectacles during close work depending upon habituation and degree of myopia. All individuals with moderate and severe degree of myopia adapt shorter working distance than mild myopic individuals without glasses.

Key Words: Degree of myopia, comfort level, near work, working distance.

Introduction:

Refractive status of eye depends upon the balance of the power of the optical components of eye.[1] The major determinants of refractive status of eye are the cornea, lens, axial length and the patient age. Power of these important components of human optical system is governed chiefly by genetics and growth. When curvature of cornea and lens are too steep and axial length of eye is too long then rays of light focus in front of eye, this condition is called as myopia. Myopic can see objects clearly at short distances, but distant objects will not be clear.[2]

The range of myopia can be divided into moderate and high myopia. Refractive error of 0 to −6 diopters is known as school myopia and > −6 diopter is known as high myopia.[3] High myopia often causes pathological changes like retinal detachment and glaucoma etc.[4] Myopia is a health issue which is affecting the vision.[5]

Sustained intensive work; for example, reading in relatively dim light, excessive computer use is associated with increased risk of myopia.[6] In Beijing Eye Study, prevalence of myopia in China was up to 22.9%. According to WHO almost 285 million people in whole world are living with serious visual problems, Women face suggestively greater risk of loss of vision than men; without major intervention visual impairment will increase to 76 million by 2020.[7] Myopic prevalence has been reported to be high in middle aged to elderly Chinese adults in urban Asian cities.[8]

Shorter working distance is also one of the risk factors means who adapt working distance less than 30cm.[9] Myopic wearing spectacles have a capacity to do near work very close to working plane. They bend over reading plane. This posture for near work is distressing for visual system and resulting into backache.[10] Asthenopia is characterized by headache, eye ache, watering, blurred vision, and itching, commonly condition becomes worst due to use of eyes for near work.[11] Treatment plan for myopia includes: Spectacle correction with single vision lenses (concave lenses), Progressive addition lenses (to slow down myopia progression), Contact lenses.

Materials and Methods:

It was comparative cross sectional study, conducted in College of Ophthalmology and Allied Vision Sciences (COAVS), from August 2014 to December 2014. Three hundred and fifty eight patients aged between 15 to 60 years were included in study by using non probability convenient sampling method. Dependant variables were working distance, near work while independent variables were comprised as age, myopia. Verbal and cooperative clients, between 15 to 60 years of age, myopic patients including progressive and high myopia, myopic astigmatism of ⩽ ±0.75DC and subjects using myopic correction since 6 months were included in study. Patients, who were mentally retarded, had any ocular pathology or visual field defect were excluded. Distance and near visual acuity was assessed by using Snellen visual acuity chart, near vision chart (N-notation) respectively and objective refraction was performed by retinoscope. Comfort level at near with and without spectacles in different degree of myopia was assessed by filling a self-structured proforma and questionnaire. Data was recorded and entered in Statistical Package for Social Science (SPSS version 20.0).The results were analyzed and tabulated by using same software.

Result:

Figure.1: working distance without spectacles

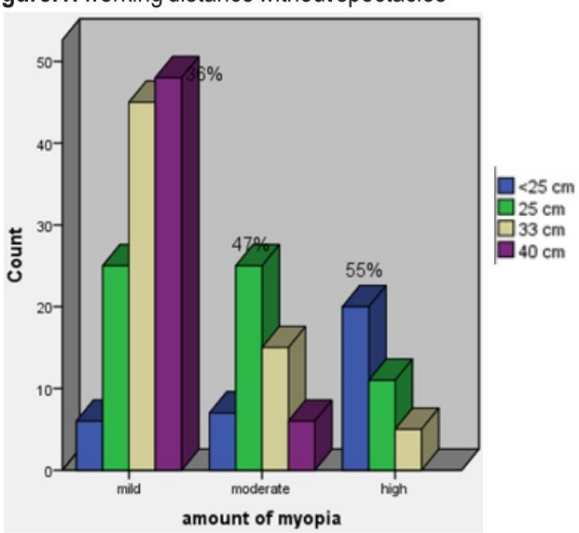

Figure.1:Headache during near work without optical correction

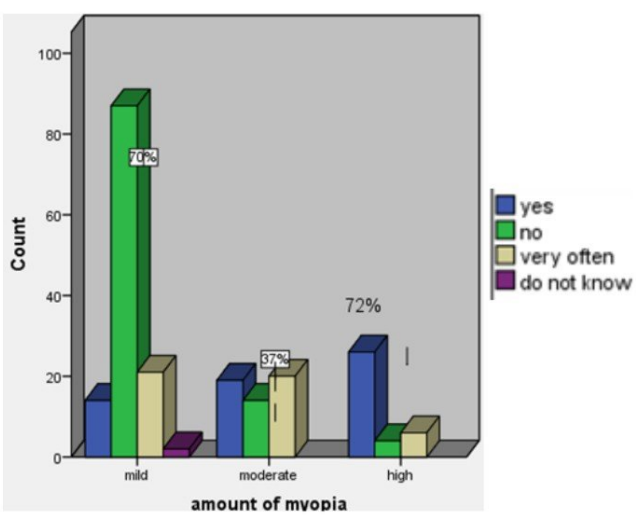

Figure.3: Eyestrain with spectacles

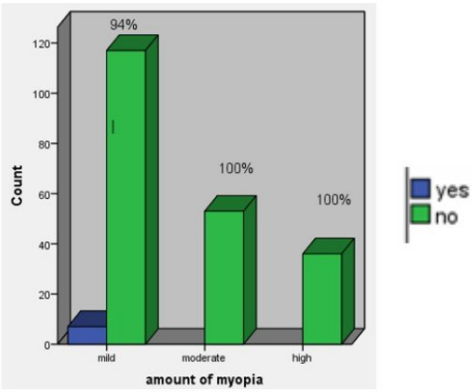

Figure.4: Difficulty in focusing near objects without correction.

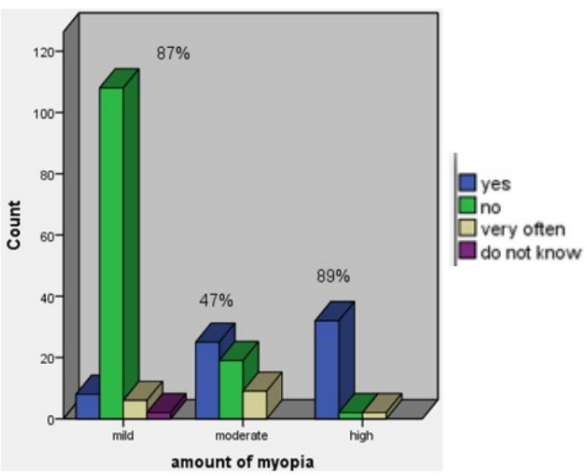

Table.1: Association between comfort level and duration of near work with spectacle

Count		duration of time spent for near work with glasses				
		<2 hour	2-4 hour	4-6 hour	<6 hour	Total
amount of myopia	mild	63	38	13	10	124
	moderate	10	11	24	8	53
	high	0	2	27	7	36
Total		73	51	64	25	213

Table.2: Chi-Square Tests

	Value	df	Asymp. Sig. (2 sided)
Pearson Chi-Square	81.390[a]	6	.000
Likelihood Ratio	92.728	6	.000
Linear-by-Linear Association	57.875	1	.000
N of Valid Cases	213		

Explanation:

Level of comfort in different degree of myopia with and without correction was defined by using variables like, working distance, headache, eyestrain, difficulty in focusing near objects, In figure 1 majority of mild myopic are significantly comfortable at 40cm without glasses while subjects with moderate and severe myopia adapted shorter working distance than mild myopes, p value is .001. In figure 2 most of subjects having severe myopia were suffering from headache without glasses during near work while moderate and mild myopic individuals were not suffering from headache showing significant effect of degree of myopia on headache as p value is .001. In figure 3 majority of mild myopic, all individuals with moderate and severe myopia were not suffering from eyestrain with glasses during near work. In figure 4 most of subjects having severe myopia had difficulty in focusing near objects without glasses during near work while moderate and mild myopic individuals had no difficulty in focusing near objects showing significant effect of degree of myopia on focusing ability for near targets as p value is .001. Table 1 shows comfort level for wearing optical correction during near work in different degree of myopia so, 51% of all mild myopic spent <2 hours while subjects having moderate and sever myopia spent significantly more time (4-6 hours) per day during near work with glasses as the p value is .001.

Discussion:

In the world 285 million individuals are suffering from severe visual impairment. If mild amount of myopia remains uncorrected it may lead to development of high myopia. High myopia is associated with sight threatning diseases of eye including retinal detachment, primary open angle glaucoma etc.

Majority of subjects with myopia are engaged in extended duration of close work which need comfortable and sharp vision at all distances resulting in a lot of stress on visual system thus increasing accomodative demands during near work. To see clearly at near tension on ciliary muscle is increased causing accomodative aesthenopia.

Visual comfort and performance depend upon degree of refractive error and treatment modalities used for refractive errors. Harb E et al. conduted a study to evaluate triggers for headache, eyestrain, results concluded that poor body posture, lighting levels, uncorrected refractive errors are underlying causes for headache, blurring of vision and eyestrain during long term intensive near work at shorter working distance.

This study was conducted to judge level of comfort in different degree of myopia with and without glasses while executing near worrk. Level of comfort is defined by following variables: habitual working distance ,wearing pattern of

spectacles, aesthenopic symptoms such as headache, eyestrain, watering, reading fluency, accomodative ability, soreness.

Results of study concluded that majorty of subjects with mild amount of myopia are more comfortable without glasses at 33cm during performing near work. Subjects with moderate amount of myopia wear their optical corrections during close work depending upon degree of refractive error, their habituation of wearing spectacles and type of near work. While individuals with severe amount of myopia are more comfortable with spectacles for execution of their near visual tasks.

Second objective of this study was to determine effect of degree of myopia on working distance. Results of anothter research showed that focal point of myopic eye is in front of eye instead of at infinity as in emmetropic individuals, so they adapt shorter working distance during near work. Rays of light emerging from more closer objects are more diverging than farther objects requiring enhanced accomodative ability of eye. Thus adaptation of working distance depend upon focal points in front of eye according to degree of myopia.

This study has proved a correlation between adaptation of working distance with and without wearing spectacles. Working distance does not significantly varies after wearing optical correction in individuals with mild amount of myopia but in moderate and severe amount of myopia working distance is significantly increased after wearing optical correction.

Conclusion:

All results concluded that mild myopes are more comfortable without glasses while individuals with severe myopia are more comfortable with glasses at near (33cm).On the other hand moderate myopes use their optical correction during close work depending upon habituation and degree of myopia. All individuals with moderate and severe degree of myopia adapt shorter working distance than mild myopic individuals without glasses.

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