Evaluation of Type of Refractive Error in Tailors

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Objective: To find out the type of refractive error most prevalent in tailors and to find association between near work and refractive error.

Method: This cross sectional study was conducted in the month of October and November 2014 involving 60 tailors in Lahore City aged between 18 to 50 years and having refractive errors. The individuals had no associated ocular pathology, and were having mild to moderate amount of refractive error. Distance (6m) a visual acuity was measured by using Snellen visual acuity chart.

Results: Majority of tailors i.e. 76.6% were having poor visual acuity ranging from 6/60-6/24. Out of 60 tailors 51.6% were having Myopia 11.7% were having Hyperopia and 36.7% showed Astigmatic refractive error.

Conclusion: All results concluded there is greater trend of myopia among tailors with astigmatic refractive error not uncommon among them. So it is concluded that near work plays a role in refractive development especially myopia.

Introduction:

The main purpose of the eye is to see clearly at any distance. "EMMETROPIA"an optically normal eye can be defined as: " state of refraction where in the parallel rays of light coming from infinity are focused at the sentient layer of the retina with minimal accommodation or being at rest". Whereas in optically imperfect eye "Ammetropia" (refractive error) rays of light coming from infinity do not focus accurately on retina.[1]

Refractive error is the focusing problem of the eye in which there is dysfunction of the eye to focus light properly. In myopia (near- or short-sightedness), there is deviation of the eye from normality in which either the axial length of the eye is too long or corneal power becomes high due to increase in its steepness that's why distant objects become unclear because light rays do not have proper focus at the retina but in front of it. In Hyperemia (far sightedness) light appears to focus behind the retina and distant or nearby objects appear blurry. In astigmatism, faint or indistinct vision occurs because of unevenly shaped cornea or lens that's why light do not have single point focus at retina[2].

Refractive errors are categorized into two main categories on the basis of cause:

- Spherical Ammetropia
- Astigmatism

In Spherical Ammetropia vision is negatively affected due to improper position of the retina in terms of axial length and focal length of the eye although eyes refractive system is regular about its optical axis and capable of forming a focused image[3].

Emmetropia is a condition wherein the eye needs no special attempt to focus rays because light rays from the objects are basically parallel and focuses the object whether it is 20feet away or more than 6m. (Thus corrective lenses are not required in Emmetropia)[4].

Investigations on animal models have provided helpful studies regarding multifaceted biological processes probable to be concerned with human ocular growth and refractive progression. Such models suggest that visually-driven feedback mechanism is responsible for control of refractive error during childhood that regulates eye growth. Environmental factors generate a visually-evoked stimulus flow that has origin in the retina, goes through the choroid, and finally leading to scleral reshaping[5]. The genetic-expression profile for sclera is likely to that of cartilage it is a form of connective tissue which is tough and highly organized and is composed of ECM (extracellular matrix) and matrix secreting fibroblasts. Therefore, active extracellular matrix reshaping have role in scleral growth finally resulting refractive error in the eye[6].

In Myopia or near sightedness vision for far objects appears blurry but there is clarity for near objects. The situation may be due to very steep corneal curvature or increase axial length[7].

Myopia results from a divergence from normality which may be change in the actual power of its refractive elements either the power of the cornea or crystalline lens and also due to deviation from the normal axial length of the eye. This result in diminished or blurred distance vision and this condition can be corrected by wearing spectacles, contact lenses or through refractive surgery. A high amount of myopia is a risk factor for several number of sight-threatening eye diseases[8].

Myopia is uncommon in childhood, but increases gradually in frequency to involve approximately 25–50% of young adult population in Western countries, and up to 80% of young adults in South East Asian popullation[9].

Myopia is a widespread ocular disorder; approximately 33% of adult population of United state is affected by this condition[10]. It is more prevalent among Asian populations, approximately 37% by age 9 years among Chinese children[11] and around 60% among youth aged 11 to 17 years in rural China[12]. Myopia is associated with other ocular pathologies and visual disorder[13].

Myopia characteristically shows a patternized course of its progression the first phase of it is emmetropic gradually there occurs a myopic shift that typically appear in the early school years, after that fast phase of myopia occurs which stabilizes in the mid to teenage years[14]. There are more chances of increase progression before it levels off[15].

Astigmatism is a commonly occurring refractive error that compromise normal vision wherein the two principal meridian of usually horizontal and vertical meridian have different refractive power. The prevalence rate of astigmatism is estimated to be 20% and 29.3% among adult population of Europe and in United States its prevalence is 36.2% among individuals of 20 years and above. Two main risk factors are anisometropia and amblyopic it occurs in accompany with other refractive errors.

Materials and Methods:

It was a Descriptive / cross sectional study. All the tailors, living in Lahore city fulfilling inclusion criteria of the study were included.

Presenting visual acuity was checked with glasses and a note on the type of refractive errors was made which was recorded in the proforma.

Results:

Table.1 Visual acuity without glasses for right eye

		Frequency	Percent
Valid	6/60-6/24	46	76.7
	6/18-6/6	14	23.3
	Total	60	100.0

Explanation: This chart explains 76.6% falls within VA ranges from 6/60-6/24 and 23.3% have VA of 6/18-6/6.

Table.02 Visual acuity without glasses left eye

		Frequency	Percent
Valid	6/60-6/24	48	80.0
	6/18-6/6	12	20.0
	Total	60	100.0

Table.03 Type of refractive error

		Frequency	Percent
Valid	Myopia	31	51.7
	Hyperpia	7	11.7
	Astigmatism	22	36.7
	Total	60	100.0

Explanation: This data shows out of 60 tailors 51.7% were myopic 11.7% hyperopic and 36.7% were astigmatic.

Discussion:

The purpose of this study was to evaluate the type of refractive error in tailors.

Descriptive cross sectional study was carried out by taking sixty tailors (18 to 50 years of age) as a study group without discrimination of gender and excluding those who have other pathological disorder of the eye.

It was found that majority of tailors have myopia i.e. 51.7% and also the astigmatic refractive error is not uncommon among them i.e. 22%. Only 11.7% were hypermetropes.

Many epidemiological investigations propose that there is a link between refractive status of the eye with hereditary and environmental factors such as the higher amount of near work done16. The etiology of myopia is unknown. In previous studies parental myopia as a genetic factor is considerable aspect in the study of myopia. Sustained intensive work is associated with increased risk of myopia. For example, reading in relatively dim light, excessive computer use is associated different accommodative patterns.[17]

Myopia is risk factor for certain other sight compromising pathology of the eye such as retinal detachment, cataract, choroidal atrophy and glaucoma.[18] Therefore it must be necessary to sought out interventions and give awareness about its progression especially the near workers.

As the ignorance of refractive error may lead to severe form of visual impairment. This risk can be decreased by taking initiative regarding awareness.

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