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Tolerance level to amount of astigmatic prescription

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Perpose: It is a routine observation that some follow up cases of refraction, in eye OPD complains of headache and eye pain. These complain are usually associated with high astigmatic prescription mostly with overcorrection and rarely with under correction.
AIMS: The purpose of study was to find out tolerance level to amount of astigmatic prescription and to evaluate the influence of tolerance to amount of astigmatism on vision.
METHODOLOGY: An informed consent was obtained describing the detail of the study and implication thereof the subjects was assured of their confidentiality of information and outcome. A detail socio demographic picture of the subjects was obtained. All information will be collected by performa attached at the end. Non cycloplegic factors were carried out of all subjects difference between objective and subjective refraction was recorded.
RESULTS: Majority of the patients had astigmatism between 0.25 to 1.00DC and they accepted cylinder less than 0.50DC. These patients were feeling comfortable with this prescription. The patient having astigmatism more than 3.00DC were feeling uncomfortable and they took time to accept the prescription so results were highly significant.
CONCLUSION: Clinician should not prescribe the high cylindrical power more than patient acceptance full prescription should not give at first visit.
KEY WORDS: Astigmatism, ATR, WTR, Cylindrical.

Introduction:

Astigmatism is the type of refractive error in which light rays coming from infinity entering the eye are not converge a point to focus on retina. Etiology it is due to distortion of cornea or lens. The refracting power is not uniform in all meridians. The principal meridian is the meridians of greatest and least refracting powers. The amount of astigmatism is equal to the difference in refracting power of the two principal meridians[1].

Astigmatism is divided in two main types regular and irregular astigmatism. Astigmatism in which refractive power of eye is equal from one meridian to another is known as regular astigmatism and the astigmatism in which irregular changed on refractive power in different meridian is known as irregular astigmatism. Irregular astigmatism further classified as Corneal irregular astigmatism present in patient who have corneal scar and keratoconus and Lenticular irregular astigmatism present usually in cataract patient. Regular astigmatism further classified based on the axis and angle between two principal meridian it includes: With the rule astigmatism [WTR] is a condition in which the vertical meridian is more curved than the horizontal thus this will require the minus cylinder at 180±20 and plus cylinder at 90 ±20 axis for correction, Against the rule astigmatism [ATR] is a condition in which the horizontal meridian is more curved than the vertical meridian correction will require the plus cylinder at 180±20 and minus cylinder at 90±20 axis and Oblique astigmatism in which principal meridian are at the right angle to each other e.g. 35 and 145. Based on focus of principal meridian it includes: Simple astigmatism in which rays are focused on the retina in one meridian either in front (simple myopic astigmatism) or behind (simple hyperopic astigmatism), Compound astigmatism in which rays of light in both meridian are focus either in front or behind the retina, and they are compound myopic and compound hyperopic and Mixed astigmatism is a condition in which light rays in one meridian are focus in front and other meridian behind the retina[2].

General trend of incidence for older adults, the average rate of change of toward ATR astigmatism is less than or equal to 0.25D every 10 years. Prevalence with respect to gender there is difference between males and females is not in considerable amount. Prevalence with respect to age includes infants are born with ATR astigmatism, preschool children have no or little astigmatism, teenage children demonstrate a shift towards WTR astigmatism, older adults show a shift towards ATR astigmatism. The prevalence of WTR, (ATR), and oblique astigmatism associated with the age was studied and noted that environmental and occupational factors also have effect on prevalence of astigmatism[3].

Cause of astigmatism includes an irregular curve in the lens and cornea. Symptoms of astigmatism include headache, blurred vision, distortion, dizziness, fatigue, strain, itching and squinting[4].The tolerance level of ATR and WTR astigmatism as compare to Oblique astigmatism is greater so neutralizing the Oblique astigmatism in early stage is necessary for better visual results in performing activities of daily life[5].

In small amount of astigmatism correction is not given. But high amount of uncorrected refractive error cause blur vision and should be corrected by experienced clinician. Management includes Corrective eyeglasses and Soft toric and RGP contact lenses are also used. Orthokeratology for flatten the cornea rigid gas permeable lenses are used in this method for the specific duration of time it remove at day time and only use at night[6]. Three surgical procedures are mainly used for treatment now days Laser in situ keratomileusis (LASIK), LASEK and photorefractive keratectomy (PRK) and 5-6 D of astigmatism can be corrected[7].

Aims & Objective:

1. To find out tolerance level to amount of astigmatic prescription.
2. To evaluate the influence of tolerance to amount of astigmatism on vision

Materials and Methodology:

This comparative cross-sectional study was conducted at College of Ophthalmology and Allied Vision Sciences (COAVS), Lahore, from August 2014 to December 2014. One hundred patients were included in study by using non probability purposive sampling method. Individuals between 15 to 30 years of age of either sex with astigmatism having no ocular pathology were included in study. Patients who were mentally retarded, non cooperative and undergone any surgical process were excluded. An informed consent was obtain describing the detail of the study and implication thereof the subjects were assured of their confidentiality of information and outcome. Non cycloplegic factors were carried out of all subject's difference between objective and subjective refraction was recorded and distance visual acuity of all subjects was assessed by using Snellen visual acuity chart.

Data was recorded on the performa and entered in statistical package for social science (SPSS version20.0). The results were analyzed and tabulated by using same software.

Table No. 1 Comparison between objective readings obtain and subjective prescriptions given

		95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
		Lower	Upper			
Pair 1	OSRE - SSRE	-.04836	.46836	1.613	99	.110
Pair 2	OCRE - SCRE	-.49316	-.30184	-8.245	99	.000
Pair 3	OARE - SARE	-5.839	6.799	.151	99	.881
Pair 4	OSLE - SSLE	-.13687	.35187	.873	99	.385
Pair 5	OCLE - SCLE	-.40463	-.13037	-3.871	99	.000
Pair 6	OALE - SALE	-1.270	12.170	1.609	99	.111

Results:

Majority of the patients had astigmatism between 0.25 to 1.00DC and they accepted cylinder less than 0.50DC. These patients were feeling comfortable with this prescription. The patient having astigmatism more than 3.00DC were feeling uncomfortable and they took time to accept the prescription so results were highly significant.

Table 1:

This table shows that difference between objective and subjective spherical power prescription of both eyes was not significant (p-value $\geqslant$ 0.05) but the difference between objective and subjective cylindrical power prescription of both eyes was significant (p-value 0.00 $\leqslant$ 0.05) and the difference between objective and subjective axis of both eyes also not significant (p-value $\geqslant$ 0.05). Where OSRE (objective sphere right eye), SSRE (subjective sphere right eye), OCRE (objective cylinder right eye), SCRE (subjective cylinder right eye), OARE (objective axis right eye), SARE (subjective axis right eye), OSLE (objective sphere left eye), SSLE (subjective sphere left eye), OCLE (objective cylinder left eye), SCLE (subjective cylinder left eye), OALE (objective axis left eye) and SALE (subjective axis left eye).

Discussion:

When treating large amount of astigmatism, or astigmatism for the first time, the doctor may not totally correct the astigmatism but slight under correction with maximum vision prescribed for trail. According to my study majority of the patients had astigmatism between 0.25 to 1.00DC and they accepted cylinder less than 0.50DC. These patients were feeling comfortable with this prescription. The patient having astigmatism more than 3.00DC were feeling uncomfortable and they took time to accept the prescription and make it difficult for the patient at first time so clinician should not prescribe the high cylindrical power more than patient acceptance. More than 60% patients accepted full correction.

Astigmatism with cylindrical value 2.50DC or great can result in isometropia amblyopia. Oblique and against the rule compound hyperopic astigmatism as compared to equal amount of simple hyperopic astigmatism cause greater amount of visual loss. If astigmatism amount is 0.50D or greater in compound astigmatism then prescription should contain some of the cylindrical value. If the patient satisfies with 0.25D cylinder, then it should be given in the new prescription even for little astigmatism of 0.25D[8].

Children with hypermetropic astigmatism corrected with spherical glasses if the astigmatism does not cause significant trouble because with astigmatic prescription patient experience effort of astigmatism accommodation. But if the vision is not satisfactory for different tasks with spherical glasses then prescription should be shifted to cylindrical correction[9].For many reasons astigmatism is clinically very important because its overcorrection cause asthenopia and under correction cause discomfort[10].

Conclusion:

Majority of the patients had astigmatism between 0.25 to 1.00DC and they accepted cylinder less than 0.50DC. These patients were feeling comfortable with this prescription. The patient having astigmatism more than 3.00DC were feeling uncomfortable and they

took time to accept the prescription so my results were highly significant. In the great majority of cases, the small errors did not give rise to discomfort, they were accepted as physiological and there were no need for treatment. Patients having high degree of astigmatism experienced headaches varying from a mild frontal ache to violent explosions of pain and a whole gamut of reflux nervous disturbances such as dizziness, irritability and fatigue. The cylindrical correction in the eyeglasses may make the floor appear to tilt, thus to tolerate this high cylindrical prescription is difficult for the patient first time so it was concluded that clinician should not prescribe the high cylindrical power more than patient acceptance full prescription should not give at first visit

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