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RESEARCH ARTICLE

“A COMPARATIVE PROSPECTIVE STUDY OF ASTIGMATISM BEFORE AND AFTER PTERYGIUM EXCISION IN A TERTIARY CARE CENTRE”

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Key words:-

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Abstract

Objective: The objective of this study is to evaluate the change in corneal refractive status before and after Pterygium excision.

Methodology: 31 patients who underwent Pterygium excision were evaluated pre-operatively and post-operatively for the assessment of astigmatic changes. All the patients having Pterygium more than grade II underwent Pterygium excision with conjunctival autografting. Pre-operative and post-operative assessment of astigmatism was done by objective refraction with Streak Retinoscope. Further, the subjective refraction was calculated and then keratometry was done by using manual Bausch & Lomb Keratometer. Post-operative astigmatism was measured after 1 week, 1 month and 3 months, to estimate how much astigmatism improves with time.

Result: All patients who underwent Pterygium excision were analyzed retrospectively, the mean age was 39.04 ± 9.91 years which ranged from 19-60 years. 70.9% cases were having grade II Pterygium, 25.8% patients were having grade III Pterygium and only one case had grade IV Pterygium. The mean preop astigmatism in grade II Pterygium was 1.10 ± 0.7 , in grade III Pterygium it was 1.5 ± 1 and in grade IV it was 6. The post op mean astigmatism in grade II Pterygium was 0.21, in grade III it was 0.4 and in grade IV it was 1. There was good correlation between grade of Pterygium and astigmatism with $r=0.528$. In all the grades of Pterygium the differences between the preoperative astigmatism and postoperative astigmatism was clinically significant with p value 0.001.

Conclusion: In cases of Pterygium, early intervention in the form of Pterygium excision with conjunctival autograft effectively reduces the amount of astigmatism, thus reducing the amount of refractive cylinder and so leads to an improvement in visual acuity.

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Introduction:-

Pterygium is derived from a Greek word meaning wing of a butterfly and by definition it is a fleshy wing shaped fibro vascular connective tissue of bulbar conjunctiva encroaches towards and onto the cornea. It can be bilateral condition and asymmetric process with one eye having a larger Pterygium than the other eye. Mostly it is located in the nasalside.

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This condition is a common ophthalmic disease and an important public health problem across the country. Pterygium is twice as common in men as in women.² It is more prevalent in older age groups, but the incidence is higher in younger individuals. It is uncommon in people younger than 20 years of age and among people who wear glasses.² The incidence increases greatly in people between 20 and 40 years of age.³ The epidemiological studies around the world have shown that the prevalence rates of Pterygium range from 0.3% to 37.46%. A recent meta-analysis of 20 studies, mostly from Asia, estimated the prevalence of Pterygium to be 10.2%.⁴ Pterygium is a very common degenerative condition seen in Indian subcontinent with a prevalence rate of 5.2%. The prevalence of Pterygium in southern India population is 9.5%.⁵

Pterygium can impair vision by number of causes like altered tear film, photophobia, epiphora, and binocular diplopia due to contraction of the tenon's capsule but the most common and utmost important cause of reduced vision is Pterygium induced astigmatism.⁶

The induced astigmatism may become significant to cause visual distortion, even in early stages of Pterygium which remains distant from the visual axis. As the progression of a Pterygium onto the cornea occur it causes significant corneal distortion and the development of large amounts of corneal astigmatism. Pterygium-induced astigmatism can be the cause of subjective visual complaints, including decreased visual acuity, glare sensitivity and monocular diplopia.⁷

Astigmatism is a type of refractive error where the refraction varies in different meridian. Consequently, the rays of light entering the eye cannot converge to a point focus but form focal lines.⁸ Refractive error is one of the causes of reversible blindness in India. According to World Health Organization (WHO) the prevalence of blindness due to refractive error in India is 1.34%.⁹

Studies suggest that the prevalence of astigmatism related refractive error can be reduced through Pterygium excision.¹⁰

Hence in this study, an effort is made to compare

The extent of astigmatic changes after pterygium excision.

Aims And Objectives:-

1. The objective of this study is to evaluate the change in corneal refractive status before and after Pterygium excision.
2. To assess the improvement in visual acuity following Pterygium excision.

Keratometer

The radius of curvature of the central cornea can be measured using a keratometer. Two main types are available but both measure the radius of curvature of a central zone of the cornea approximately 3mm in diameter. The central or axial area of the cornea, about 4mm in diameter, is usually assumed to be a spherical refracting surface. The keratometer thus read within this zone. The radius curvature of the axial zone of the emmetropic eye is about 7.8mm. The optical power of the cornea can also be expressed in dioptres. The precise value is determined by curvature of the anterior and posterior surfaces as well as the refractive indices of the cornea and the media at each surface, however for most cornea an approximation is provided by the keratometer equation in which the refractive index of tear is standardized to 1.3375 so that a radius of curvature of 7.5mm corresponds to 45D.

$$D = \frac{n_2 - n_1}{r} = \frac{1.3375 - 1}{r}$$

Where D is the power in dioptres and r is the radius of the anterior corneal curvature expressed in meters. For example

$$D = \frac{1.3375 - 1}{0.0078} = +43.27$$

The more peripheral cornea is flatter and non-spherical. Optically, it is the central 4mm spherical zone which is utilized for vision, the periphery being screened off by the pupil. Visual acuity suffers when the pupil is widely dilated.

Material And Method:-

It is a case series study of 31 patients having Pterygium who fulfill the inclusion criteria and are willing to undergo Pterygium surgery. This study was conducted in the department of ophthalmology, Santhiram medical college and general hospital, Nandyal. All the cases were evaluated and managed at our hospital.

Written informed consent (in English and local language) was taken from all study subjects, before enrolment in the study. A detailed protocol was made after referring several books and literature and after consulting concerned surgeons of the department.

All the patients were admitted as per protocol and Written Informed consent to be taken one day prior to surgery. These patients were underwent complete eye examination, including full history of any previous ocular disease or surgery and routine investigation and evaluation. All the patients having Pterygium more than grade II underwent Pterygium excision with conjunctival autografting. Pre-operative and post- Operative assessment of astigmatism was done by objective refraction with Streak Retinoscope. Further, the subjective refraction calculated and then Keratometry was done by using manual Bausch & Lomb Keratometer

Selection Criteria

Inclusion criteria for the study group:

Patient with primary Pterygium grade II in one or both eyes will be included in the study.

Exclusion criteria for the study group:

1. Patient with recurrent Pterygium, pseudopterygium, keratoconus, lenticonus, corneal dystrophy were excluded from this study.
2. Patient with cataract and retinal disease where Pterygium excision will not help in visual acuity improvement, were excluded from this study.

Pre Operative Assessment

Patients were admitted one day before surgery. Detailed history was taken of each patients and anterior segment examination was performed using slit lamp examination. All patients Pterygium grading was done. Pterygium was graded depending on the extent of the corneal involvement: Grade I crossing limbus, Grade II -midway between limbus and pupil, Grade III -reaching up to pupillary margin, Grade IV -crossing pupillary margin. Visual acuity was checked with snellen's visual acuity chart. Ocular movements assessed in all nine gazes for presence of any restriction of movement. Keratometry reading using Bausch and Lomb keratometer was done for all cases. After pupillary dilation detailed fundus examination done using indirect ophthalmoscopy or 90D lens and Retinoscopy was done.

Preoperative Treatment:

All the patients were given preoperatively topical eye drop flubichlor four times a day which contain flurbiprofen and chloramphenicol.

Preoperative Preparation:

For all the case eyelashes were trimmed, xylocaine sensitivity test was done.

Lacrimal sac patency was checked before surgery

Instruments And Material Required During The Surgery

1. Wirespeculum.
2. Round body needle with thread for superior rectus bridle suture if required.
3. Westcott scissors (sharptips)
4. 64 beaverblade
5. 3x3 sterile gauzesponges
6. BSS 15 or 30cc

7. Conjunctival forceps.
8. Iris repositor.
9. 10-0 Nylon suture.
10. Needle holder.
11. Suture tying forceps.
12. 26G Needle with 2 CC Syringe
13. Crescent blade.
14. Lims forceps.

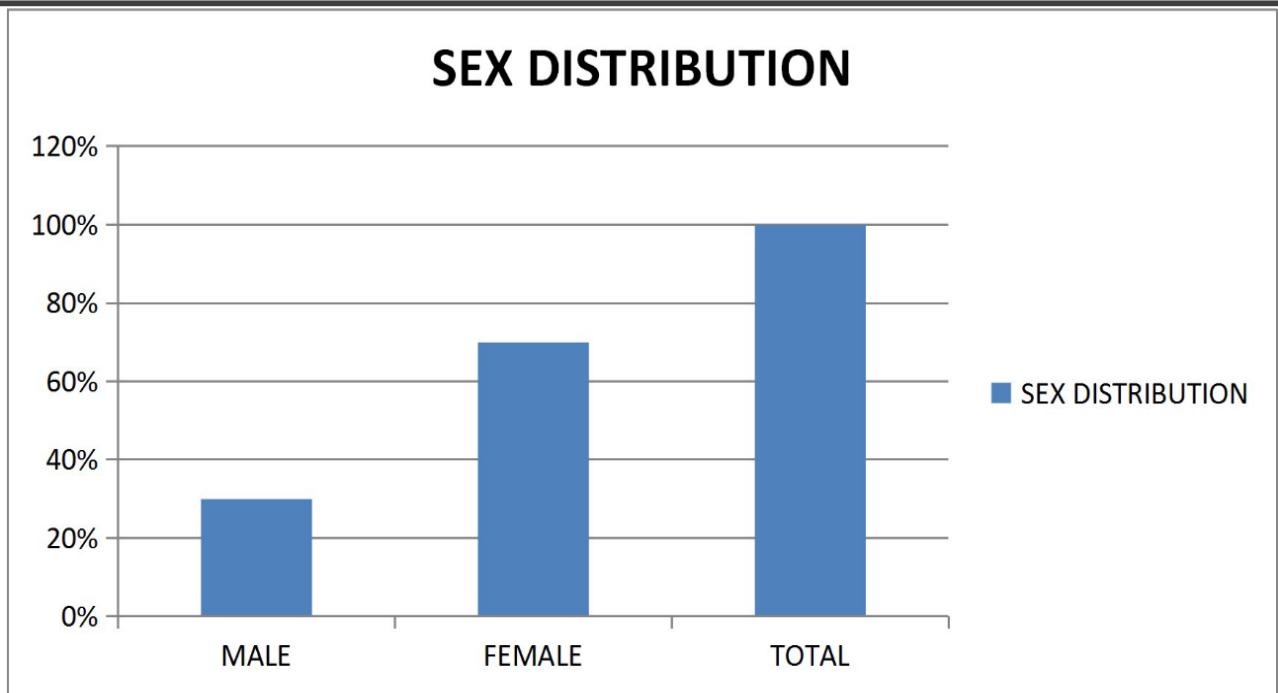
Observation And Results:-

It is a case series study, comparing the occurrence of Astigmatism before and after Pterygium excision at Santhiram medical college, Nandyal. Total 31 cases were studied after obtaining approval from the institutional ethical committee and written informed consents for both the study and pterygium excision procedure were taken from the patients in their own language. Most of the cases were female genders who were farmers by occupation.

Table 1:- Sex Distribution

SEX	NUMBER	PERCENTAGE
MALE	9	29%
FEMALE	22	71%
TOTAL	31	100%

In the present study out of 31 cases, 9 were male (29%) and 22 (71%) were female. [Table 1, Graph 1]



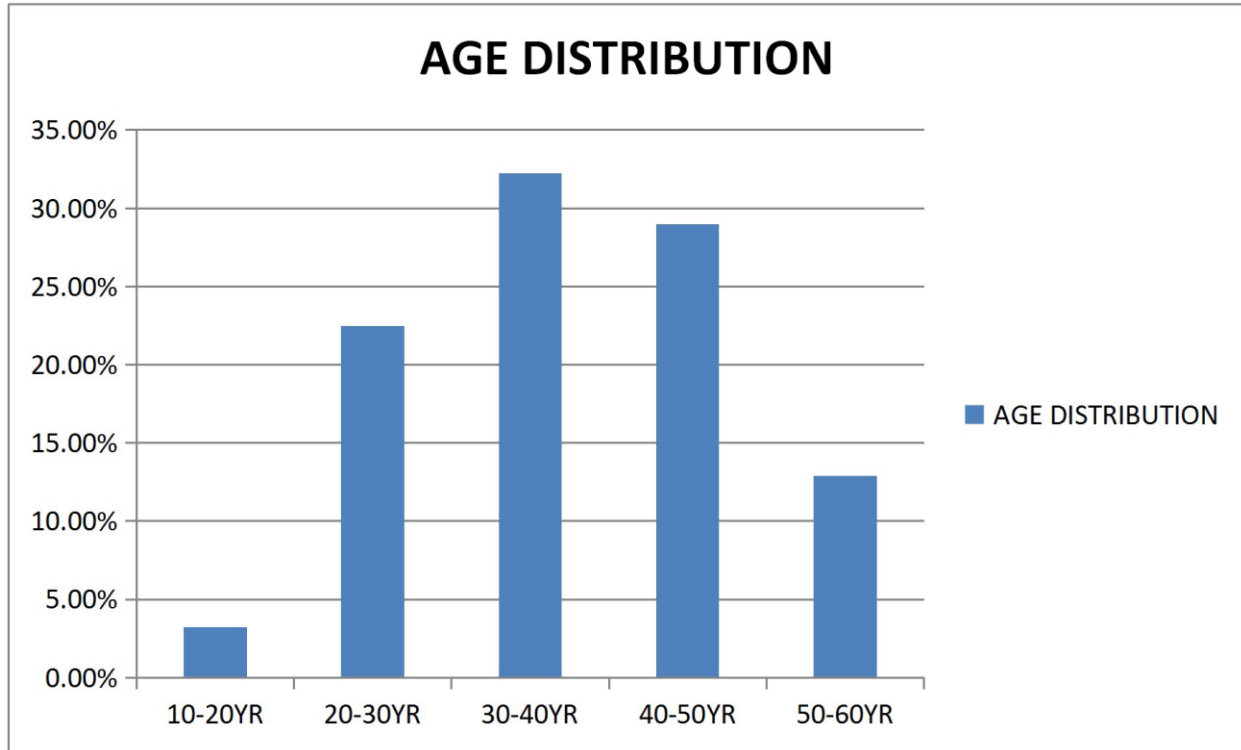
Graph 1:- Bar graph showing sex distribution.

In this study 31 cases, underwent Pterygium excision which were analyzed retrospectively. The mean age was found to be 39.04 ± 9.91 years which ranged from 19-60 years. Majority of patients were in the range of 30-40 years that is 32.2%, 29% were between 40-50 year age, 22.5% patient were in between 20-30 years age, 12.9% were between 50-60 years and only 3.2% patients were between 10-20 years. [Table 2, Graph 2]

Table 2:- Age Distribution

AGE	NUMBER	PERCENTAGE
10-20YR	1	3.2%

20-30YR	7	22.5%
30-40YR	10	32.2%
40-50YR	9	29%
50-60YR	4	12.9%
TOTAL	31	100%

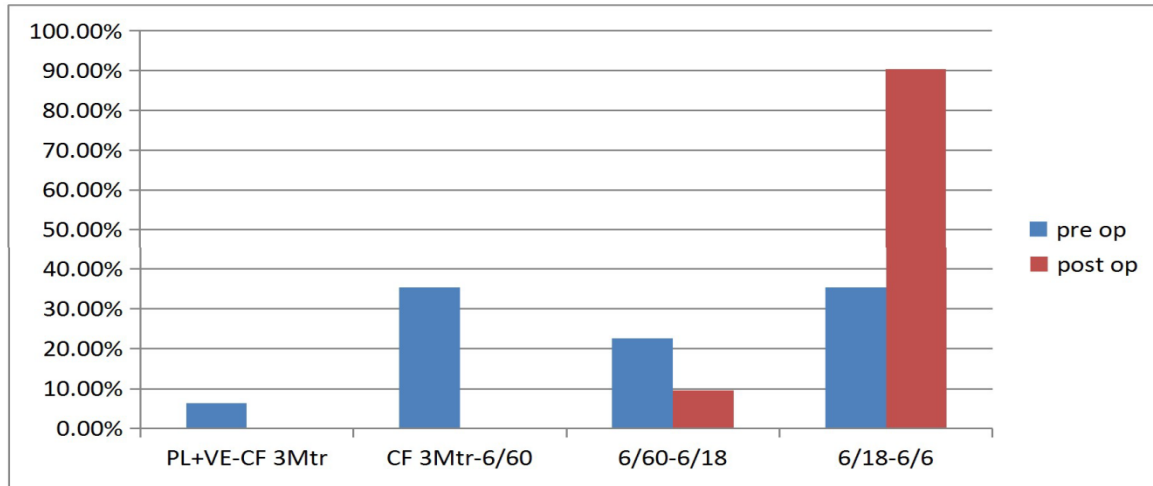


Graph 2:- Bar graph showing age distribution.

In this present study out of 31 cases preoperatively, 6.4% cases had vision between PL+ve – CF at 3Mtrs, 35.4% cases had vision between CF at 3Mtrs to 6/60, 22.5% cases had vision between 6/60 to 6/24 and 35.4% patients had vision between 6/24 to 6/6. Postoperatively majority of patients (90.4%) had visual acuity between 6/24- 6/9 and 9.6% patients had vision between 6/60 to 6/24. There was a statistical significance between preoperative and postoperative visual acuity with p value 0.0001. [Table 3, Graph 3]

Table 3:- Visual Acuity Chart.

Visual acuity	Pre op number	Pre op Percentage	Post op Number	Post op percentage
PL+ve- CF 3Mtr	2	6.4%	0	0
CF 3Mtr- 6/60	11	35.4%	0	0
6/60-6/18	7	22.5%	3	9.6%
6/18-6/6	11	35.4%	28	90.4%
Total	31	100%	31	100%

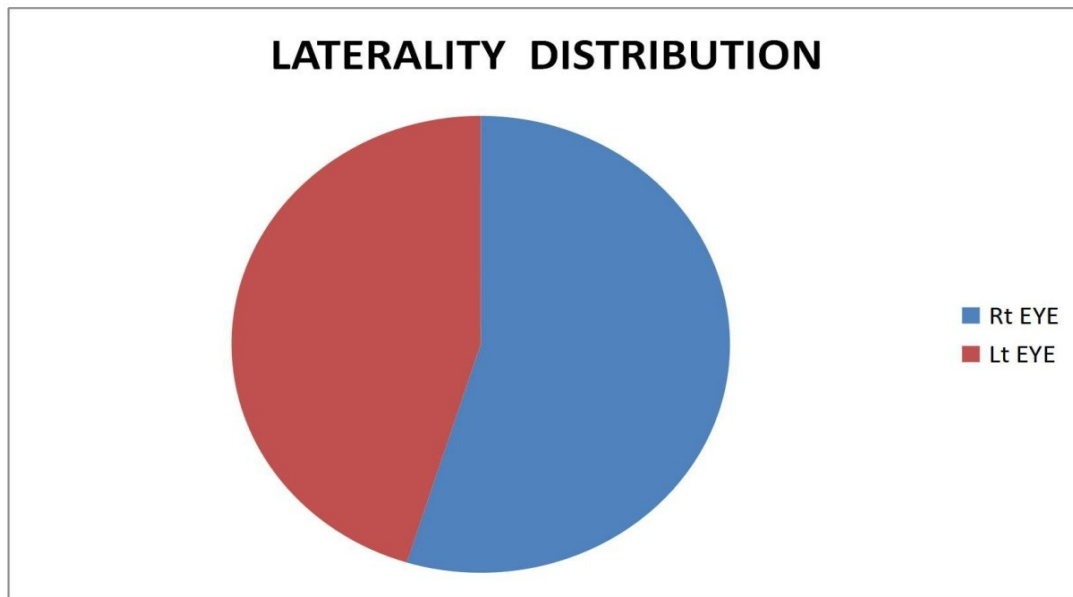


Graph 3:- Bar graph showing comparison of visual acuity before and after Pterygium excision.

Among the 31 study population 54.8% had right eye Pterygium and 45.2% had left eye Pterygium. [Table 4, Graph 4]

Table 4:- Laterality Distribution

Laterality	Number	Percentage
Right eye	17	54.8%
Left eye	14	45.2%
Total	31	100%



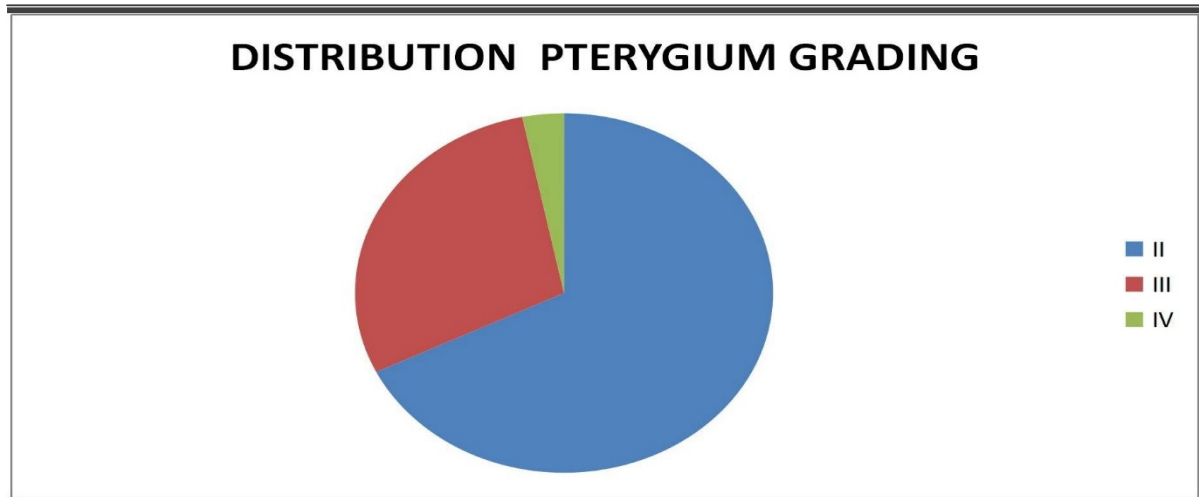
Graph 4:- Pie graph showing laterality distribution.

Most of the patients were having grade II Pterygium, that is 70.9%, 25.8% patients were having grade III Pterygium and only one case had grade IV Pterygium. [Table 5, Graph 5]

Table 5:- Grading Of Pterygium.

Grade Of Pterygium	Number	%

II	22	70.9%
III	8	25.8%
IV	1	3.3%

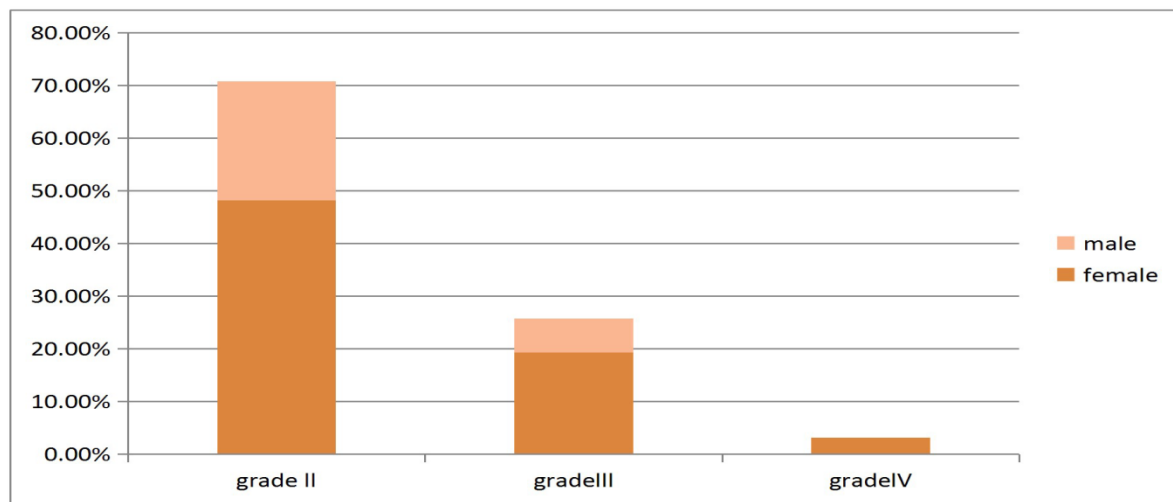


Graph 5:- Pie graph showing distribution of Pterygium grading.

Among the 22 female cases 15 were having grade II Pterygium, 6 of were having grade III and only cases had grade IV Pterygium. Among the 9 male patients 7 were having grade II Pterygium and 2 were having grade III Pterygium. There is no correlation between grades of Pterygium and gender with r value 1. [Table 6, Graph 6]

Table 6:- Grades Of Pterygium And Gender Correlation.

GRADE	FEMALE		MALE		TOTAL
Grade II Pterygium	15	48.16%	7	22.58%	22
Grade III Pterygium	6	19.35%	2	6.4%	8
Grade IV Pterygium	1	3.2%	0	0	1
TOTAL	22		9		31



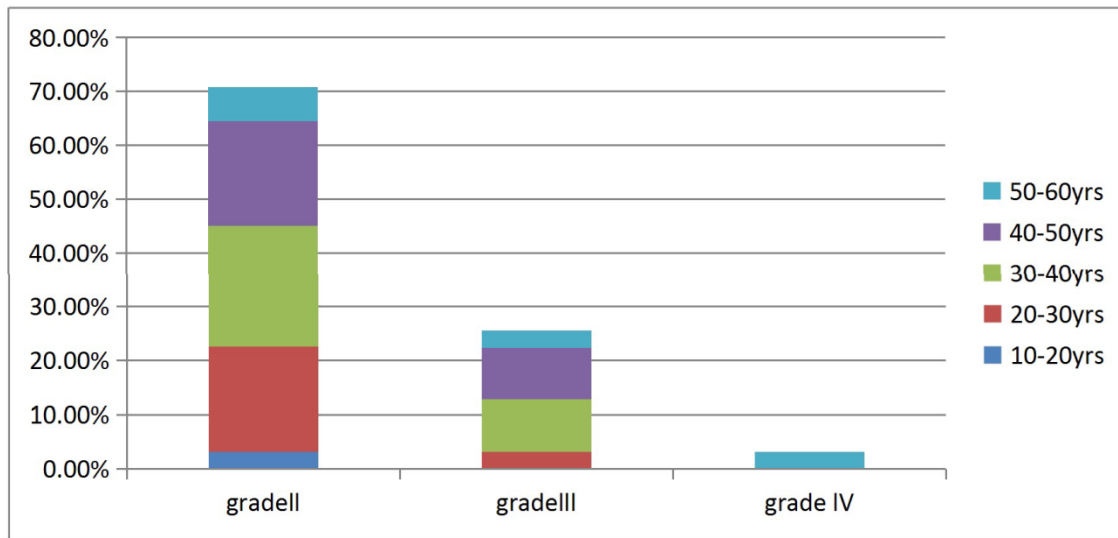
Graph 6:- Bar graph showing grade of Pterygium and Gender correlation.

Among 22 grade II Pterygium patients, 3.2% were between 10-20 years, 19.35% were between 20-30 years, 22.58% were between 30-40 years, 19.35% were between 40-50 years and 6.4% were between 50-60 years. Among grade III Pterygium 3.2% were between 20-30 years, 9.6% were between 30-40 years, 9.6% were between 40-50 years and only 3.2% were between 50-60 years. In grade IV Pterygium only 3.2% were between 50-60 years. The correlation

between age and grades of Pterygium calculated using Pearson’s correlation coefficient and there was positive correlation between age and grades of Pterygium with r value 0.382. [Table7, Graph 7]

Table 7:- Grade Of Pterygium And Age Correlation.

AGE	Grade II Pterygium		Grade III Pterygium		Grade IV Pterygium		Total
	Count	Percentage	Count	Percentage	Count	Percentage	
10-20yrs	1	3.2%	0	0	0	0	1
20-30yrs	6	19.35%	1	3.2%	0	0	7
30-40yrs	7	22.58%	3	9.6%	0	0	10
40-50yrs	6	19.35%	3	9.6%	0	0	9
50-60yrs	2	6.4%	1	3.2%	1	3.2%	4
Total	22		8		1		31



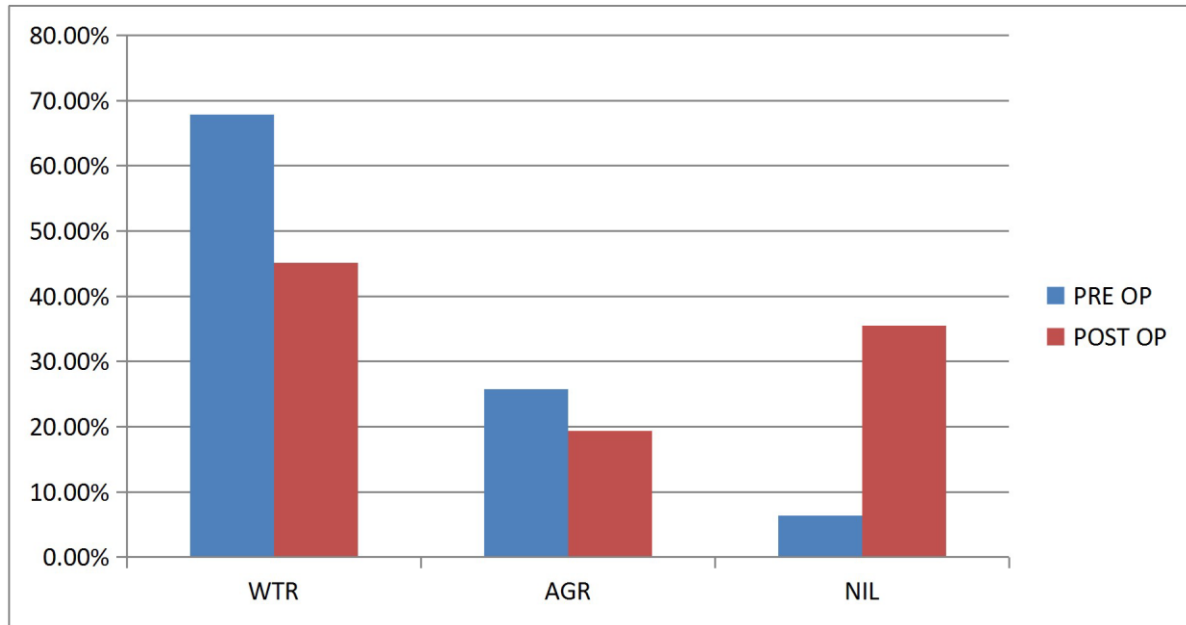
Graph 7:- Bar graph showing grade of Pterygium and Age correlation.

Majority of the cases have ‘with the rule’ astigmatism changes, which varies from 0.5 to 6D. Among the 31 Pterygium cases preoperatively 67.8% had ‘with the rule’ astigmatism,

25.8% had ‘against the rule’ astigmatism and only 6.4% were without any astigmatism changes and postoperatively 45.16% had ‘with the rule’ astigmatism, 25.8% patients had ‘against the rule’ astigmatism and 41.9% had no astigmatism changes and the differences between preoperative and postoperative changes were clinically significant with p value <0.001. [Table 8, Graph 8]

Table 8:- Types Of Astigmatism.

ASTIGMATISM	Pre op		Post op	
With the rule	21	67.8%	14	45.16%
Against the rule	8	25.8%	8	25.8%
Nil	2	6.4%	13	41.9%
Total	31	100%	31	100%

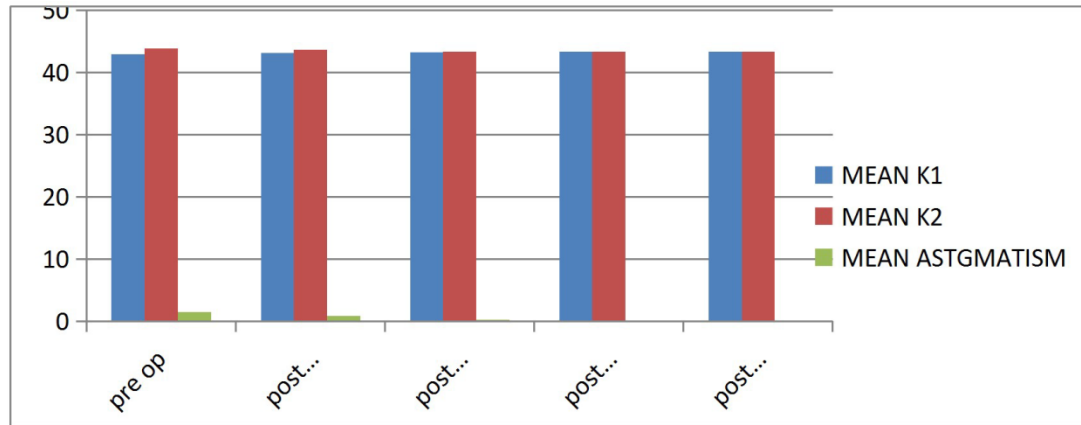


Graph 8:- Bar graph showing types of astigmatism.

Table 9:- Mean Keratometry Before And After Pterygium Excision.

Astigmatism	Pre op	Post p day 1	Post p 1 week	Post p 1 month	Post op 3month
Mean k1± sd	43.0±1.9	43.19± 1.5	43.29±1.2	43.33±1.27	43.34±1.26
Mean k2±sd	43.9±1.4	43.67 ±1.3	43.4± 1.3	43.38±1.3	43.36±1.29
Mean Astigmatism±sd	1.43±1.1	0.83 ± 0.7	0.29±0.27	0.12 ±0.16	0.08±0.11

The pre operative mean K1 (H) was $43.0 \pm 1.9D$, K2 (V) was $43.9 \pm 1.4D$ and mean astigmatism was $1.43 \pm 1.1D$. At post op day 1 the mean K1 was $43.19 \pm 1.5D$, K2 $43.67 \pm 1.3D$ and mean post day 1 astigmatism $0.83 \pm 0.7D$. At post op 1 week the mean K1 $43.29 \pm 1.2D$, the mean K2 $43.67 \pm 1.3D$ and mean post op 1 week astigmatism was $0.29 \pm 0.7D$. At 1 month the post operative mean K1 $43.33 \pm 1.27D$, K2 $43.38 \pm 1.3D$ and 1 month post op mean astigmatism was $0.12 \pm 0.16D$. At the end of 3 months post operatively, the mean K1 was $43.34 \pm 1.26D$, mean K2 $43.36 \pm 1.29D$ and mean astigmatism was $0.08 \pm 0.11D$. The differences between preoperative and postoperative astigmatism were clinically significant with p value 0.0001. The mean astigmatism changes gradually decreased and at the end of 3 month it was very less. [Table 9, Graph 9]



Graph 9:- Bar graph showing mean astigmatism before and after Pterygium excision.

Table10:- Grade Of Pterygium With Preop Mean Astigmatism.

Grade Of Pterygium	Number	%	Pre op Mean astigmatism±SD
II	22	70.9%	1.10 ±0.7D
III	8	25.8%	1.5 ± 1D
IV	1	3.3%	6

The mean pre-op astigmatism in grade II Pterygium was 1.10 ± 0.7D, in grade III Pterygium it was 1.5 ± 1D and in grade IV it was 6D. It was evident that pre-op astigmatism increases with the increase in Pterygium grading.

Table 11:- Grade Of Pterygium With Post Op Mean Astigmatism.

Grade Of Pterygium	Number	%	Post op mean astigmatism±SD
II	22	70.9%	0.21 ± 0.2D
III	8	25.8%	0.4 ± 0.2D
IV	1	3.3%	1

The post-op mean astigmatism in grade II Pterygium was 0.21±0.2D, in grade III it was 0.4±0.2D and in grade IV it was 1D.

Table 12:- Correlation between astigmatism and Pterygium.

Grade Of Pterygium	Number	%	Pre op Mean astigmatism±SD	Post op mean astigmatism±SD	Correlation between mean astigmatism and grade of Pterygium	P value
II	22	70.9%	1.10 ±0.7D	0.21 ± 0.2D	r=0.580	0.0001
III	8	25.8%	1.5 ± 1D	0.4 ± 0.2D	r = 0.540	0.000
IV	1	3.3%	6	1	r =0.543	0.001

There was a good correlation between grades of Pterygium and astigmatism with correlation coefficient r-0.528. In all the grades of Pterygium the differences between the preoperative astigmatism and post operative astigmatism was clinically significant with p value 0.001.

Table 13:- Comparison of different studies regarding the astigmatism changes following Pterygium excision.

Studies	AGE	SEX M:F	Pterygium grades distributions	Preop	Post op

			Mean age			mean astigmatism	mean astigmatism
Maheshwari S et al. on 2003					grade I: nil	Grade II: 2.9D ±	1.64±1.45D
					grade II: 44.4%	0.65D	1.65±1.19D
					grade III: 33.3%	Grade III	4.46±2.92D
					grade IV: 19.45%	3.83±1.75D.	
						Grade IV: 9.42	
						±2.64D	
Shelke E et al. 2014	41-50yr	22:15		Grade I -2.7%	Grade I-0.75D	0.75D	
				Grade II-51.3%	Grade II-2.46±0.5D	0.9±0.27D	
				Grade III-37.8%	Grade III-4.0±0.5D	1.89±0.64D	
				Grade IV-8.1%	Grade IV-6.5±0.6	2.66±0.75D	
Bhargav P et al. 2015	40.9sd12.9 yrs	29:2		Grade I-21.15%	Grade I-1.1±1.2D	0.36±0.46D	
				Grade II-23.07%	Grade II-1.1± 0.7D	0.33±0.49D	
				Grade III-23.07%	Grade III-2.7±1.4D	0.76±0.48D	
				Grade IV-32.69%	Grade IV 4.28±2.5D	1.8±1.7D	
Saleem on 2011	et	al.		23:7	Grade I: 50% Grade II: 43% Grade III: 7%	4.32 ± 1.88D	2.11 ±
							1.96D
Khan F et al. 2014			43.43	3:1		2.25D	1.30D
			14.3 years				
Errais K et al. 2004			49.3±19.6	3:14		5.47±3.45 D	1.79±1.52
			4 years				
Our study			39.04±9.9	22:9	Grade I-nil Grade II-70.9% Grade III-25.8% Grade IV-3.3%	Grade II- 1.10 ±0.7D Grade III- 1.5 ± 1D Grade IV- 6D	0.21 ± 0.2D 0.4 ± 0.2D 1D
			years				

Discussion:-

In this study, 22 patients were female and 9 were male but in other similar studies, male patients have a higher preponderance, except Errais K et al 2004. One would expect a higher incidence in males as they are more exposed to UV radiation. The likely reason behind the above differences was, while choosing patients randomly we got more number of female patients who were outdoor laborworker

The mean age patients with occurrences of Pterygium in this study is 39.04±9.94 years and which ranges from 19-60 years. This is almost similar to study done by Bhargav P et al 2015 and Khan F et al 2014, but according to Lornanthakul et al study 2017 and Errais et al study the mean age was 56.2±10.9, 49.3±19.64 years respectively. The age of onset corresponds well with the onset of exposure to risk factors. Patients between 14-20 years had stage I to II pterygium lesion, 25- 30 years had stage III- IV pterygium and 40- 70 age group shown more of stage V- VII pterygium suggesting a key role of the aging immune system.

All the other studies have similar finding except Bhargav P et al where maximum patients were in grade IV followed by similar percentage of patients in grade II and grade III followed by grade I. The incidence and prevalence of Pterygium formation is more closely related to environmental factors than any other risk factors. There is higher frequency of Pterygium formation in warm, sunny and windy areas. The reason behind the variation noted in grading of Pterygium done by Bhargav Patel et al was that the study was done in Gujarat where climate is a very hot & windy, which induces Pterygium formation.

In this study, pre-operatively 6.4% patients had vision between PL+ve – CF at 3Mtr, 35.4% patients had vision between CF at 3Mtr to 6/60, 22.5% patients had vision between 6/60 to 6/24 and 35.4% patients had vision between

6/24 to 6/6. Postoperatively of patients had visual acuity between 90.4% between 6/24- 6/9 and 9.6% patients had vision between 6/60 to 6/24. There is a statistical significance between preoperative and postoperative visual acuity with p value 0.0001. So it suggested that Pterygium causes a significant vision loss due to induced astigmatism and excision of Pterygium improved the visual acuity in patients.

Among the 31 patients 54.8% had right eye Pterygium and 45.2% had left eye Pterygium, but the difference is not clinically significant. From this we infer that there is no association between Pterygium and laterality.

The mean preoperative K1 (H) was 43.0 ± 1.9 , K2 (V) was 43.9 ± 1.4 D and mean astigmatism was 1.43 ± 1.1 D. On post operative day 1, the mean K1 was 43.19 ± 1.5 D, K2 43.67 ± 1.3 D and mean post operative day 1 astigmatism was found to be 0.83 ± 0.7 D. On post 1 week the mean K1 43.29 ± 1.2 , the mean K2 43.67 ± 1.3 D and mean post op 1 week astigmatism was 0.29 ± 0.7 D. After 1 month the mean post operative K1 was 43.33 with ± 1.27 , K2 43.38 with ± 1.3 and mean post operative astigmatism at 1 month was 0.12 with ± 0.16 D. At 3 months, the mean K1 was 43.34 with ± 1.26 , mean K2 43.36 with ± 1.29 and mean post 3 month astigmatism was 0.08 with ± 0.11 D.

The differences between pre operative and post operative astigmatism was clinically significant with p value 0.0001. From the above we infer that the astigmatism differences between pre and post operative day 1 was 0.6 D, which at post op 1 week, further decreased to 0.54 D. At end of 1 month, it decreases to 0.12 D and at end of 3 months it decreases furthermore to 0.08 D. So the mean Keratometry astigmatism was consistently decreasing till the end of 3 month with peak differences at 1st post operative day followed by post op 1 week.

Majority of the cases have with the rule astigmatism changes, which varies from 0.5 to 6 D. Among the 31 Pterygium cases, preoperatively 67.8% had with the rule astigmatism, 25.8% had against the rule astigmatism and only 6.4% were not having any astigmatism and postoperatively 45.16% had with the rule astigmatism, 19.35% patients had against the rule astigmatism.

After Pterygium excision, there was a 22.6% decrease in with the rule astigmatism and no changes noted in against the rule astigmatism and 29.1% patients increases towards no astigmatism. A pterygium generally causes localized flattening central to the apex of the pterygium. As this flattening is along the horizontal meridian, it usually causes with-the-rule corneal astigmatism.

The Pterygium was graded and astigmatism was calculated pre operatively and postoperatively, similar grading system followed by Maheshwari S et al on 2003, Saleem et al on 2011, Shelke E et al 2014 and Bhargav P et al 2015. In our study 70.9% were grade II Pterygium and 25.8% were grade III Pterygium and 3.3% were grade IV Pterygium.

In this study the difference in mean preoperative astigmatism changes and mean postoperative astigmatism changes in all the grading of Pterygium were almost similar to Maheshwari S et al and Shelke et al. But Bhargav Patel et al. noticed lesser astigmatism compared to the grading of Pterygium. Studies done by Saleem M et al. Errais K et al. and Khan F et al. only noticed the mean astigmatism changes pre and postoperatively but didn't correlated with different grading of Pterygium though there is a significant changes noticed.

The preoperative astigmatism in grade II pterygium 1.10 ± 0.7 D which became 0.21 ± 0.2 D postoperatively so there was a change of 0.9 ± 1 D astigmatism observed. In grade III Pterygium the preoperative mean astigmatism was 1.5 ± 1 D which at postoperatively became 0.4 ± 0.2 D. Here also difference of 1.1 ± 1 D astigmatism was observed and in grade IV Pterygium preoperative mean astigmatism was 6 D and which became 1 D postoperatively & huge difference of 5 D astigmatism was observed.

This studies shows that, in cases of grade II & III Pterygium if operated showed 1- 1.5D change in astigmatism, but in patients with grade IV Pterygium, after surgery there was drastic shift in astigmatism of 5 D.

Conclusion:-

This comparative study of astigmatism changes before and after pterygium excision among 30 patients having greater than grade II pterygium helped us in certain conclusions.

The present study verifies that as the size of Pterygium increases, amount of astigmatism also increases in direct proportion, thereby decreasing the visual acuity.

In cases of Pterygium, early intervention in the form of Pterygium excision with conjunctival autograft effectively brings down the amount of astigmatism, thus reducing the amount of refractive cylinder and so leads to an improvement in visual acuity.

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