

# A study of Astigmatism in Cataract Patients

Pranda Shukla

Associate Professor, Department of Ophthalmology, Government Medical College, Jagdalpur, Bastar 494001 Chhattisgarh, INDIA.

Email: [drpranda@yahoo.co.in](mailto:drpranda@yahoo.co.in)

## Abstract

**Purpose:** To analyze the pattern and presentation of corneal astigmatism in cataract patients. **Materials and Methods:** one hundred cases of both sexes were selected from Out Patient Department of Ophthalmology of a Medical College belonging to various stages of cataract. Patient with history of glaucoma surgery having, Pterygium, Chalazion, Lids swelling didn't include in the study. **Results and Conclusion:** Corneal Astigmatism less than 1D was present in most cataract patients with slight differences between the various age ranges this information is useful for surgeons to change the surgical techniques to minimize the postoperative Astigmatism.

**Keywords:** Astigmatism with the rule, against the rule.

## Address for Correspondence

Dr. Pranda Shukla, Eye Specialist, First floor, New Royal Medical Store, In front of Maharani Hospital, Jagdalpur Dist.-Bastar, Chhattisgarh, 494001 INDIA.

Email: [drpranda@yahoo.co.in](mailto:drpranda@yahoo.co.in)

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## INTRODUCTION

Astigmatism is that type of refractive anomaly in which no point focus is formed owing to unequal refraction of the incident light by the dioptric system of the eye in different meridians. Astigmatism depends on the presence of toroidal instead of spherical curvature of the refraction surface of the eye the refractive power as a whole therefore instead of being equal in all meridians, changes from one meridian to the next by uniform increments, and each meridians generally has an uniform type of curve. Such a condition was called regular astigmatism by donors (1864) and was correctable by cylindrical lens. However on cases of corneal disease or lenticular sclerosis, there are irregularities in the curvature of meridian conforming to no geometrical figure, the condition is called irregular astigmatism, such a defect can't be compensated by spectacle lens. As a rule major and minor meridians are at right angles if they differ significantly from the vertical and horizontal and if they

are not at right angle, the optical condition is bi-oblique astigmatism. Astigmatism may either be an error of curvature, centering or refractive index. Curvature astigmatism, if of very high degree, has its seat most frequently in the cornea. The anomaly is usually congenital and its occurrence in small degree is almost invariable. The most common error is one where in the vertical curve is greater than horizontal (about 0.25D) this is known as direct Astigmatism or astigmatism with the rule and accepted as physiological it is due constant pressure of the upper lid upon the eye. An acquired astigmatism is seen in disease of cornea, results in its deformity, an eg: Keratoconus, while inflammation and ulcerations produce the same effect. Traumatic interference including surgical trauma (particularly operations for cataract), with the cornea may bring the same result. In view of the above, and as very few reports of such studies were available and in 1957 a study group of World health organization (WHO) has expressed the view that in order to get a comprehensive picture of disease more and more studies have to be carried out, Garg Narendra K.<sup>1</sup> This prompted the authors to undertake this study to find out the magnitude of astigmatism as per age sex.

## MATERIALS AND METHODS

The present study was carried out in the department of Ophthalmology, Govt. Medical College and associated Hospital, Jagdalpur, between October 2013 to September 2014. A sample of one hundred cases was selected from

the outpatient department belongs to various stages of cataract. Patients name, Age, Sex and address of 100 cases were recorded in a pre-drawn proforma. All cases were examined clinically, detailed history was taken. Enquiry regarding status of refraction in other eye was noted whenever possible with special reference to Astigmatism. Complete ocular examination was carried out in every case. Patients with history of glaucoma surgery having pterygium, Chalazion, And Lids welling were not included in the study. Preoperative corneal curvature was recorded with the help of keratometre and recorded in different meridian to find out astigmatism.

**RESULTS**

After analysis of the collected data it has been noted that out of hundred cases, 60% were males and 40% cases females, 7% cases were under 40 years of age they had cataract mainly of traumatic and developmental type(Table-I) shows that 23% cases did not show any astigmatism and were as 77% case had astigmatism. The range was 0.25D to 2D and the average preoperative astigmatism was 0.842D. Table further reveals that average astigmatism with the rule, average astigmatism against the rule was 0.89 i.e. 46% had against the rule, and average oblique astigmatism was recorded 1.00D i.e. 1% had oblique astigmatism and remaining 23% had no astigmatism.

**Table 1:** Distribution of Astigmatism in Cataract Patient

Range	Below 40 years				40-50 Years				51-60 Years				61-70 Years				>70 Years			
	W R	A R	OA O	N O	W R	A R	OA O	N O	W R	A R	OA O	N O	W R	A R	OA O	N O	W R	A R	OA O	N O
0-0.5	0	0	0	2	4	2	0	6	5	3	0	9	2	2	0	5	0	2	0	1
0.5-1	3	2	0	0	2	6	1	0	8	10	0	0	1	8	0	1	0	1	0	0
1-2	0	0	0	0	1	4	0	0	4	2	0	0	0	2	0	0	0	2	0	0
2-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7%				26%				41%				20%				6%			

**DISCUSSIONS**

The average astigmatism in the present study was 0.842D which is nearly same as astigmatism has been reported by Duke Elder<sup>7</sup> 0.5 -0.75D, Beasley<sup>5</sup> 0.75D, Luntz<sup>10</sup> 0.75D, Mahesh S.V. *et al.* (8) 0.42 to 0.77D, Kamlesh *et al.*<sup>4</sup> 0.83D and Ravindran.<sup>3</sup> Singh D. *et al.*<sup>2</sup>, reported astigmatism of 1.19D which is quiet higher than our series. In the present series 30% had astigmatism with the rule 46% had against the rule, 1% had oblique astigmatism and remaining 23% had no astigmatism. Our reading of astigmatism with the rule is similar to that reported by jaffe N.S.<sup>1</sup>, Singh and Kumar<sup>2</sup> 30%, Singh Y.P. and Goel V.K.<sup>6</sup> 21%, Mahesh S.V. *et al.*<sup>8</sup> 32%, while it is less than kamlesh *et al.*<sup>4</sup> 41.2% Ravindran<sup>3</sup> 50% The readings were against the rule astigmatism is similar to those of Singh and Kumar<sup>2</sup> 45%, Jaffe N.S.<sup>1</sup> 42.5%, Ravindran<sup>3</sup> 50%, Kamlesh *et al.*<sup>4</sup> 54.6%. Bansal R.K. *et al.*<sup>9</sup> noted hundred percent which were higher in comparisons to our study. In contrast to this Mahesh S.V. *et al.*<sup>8</sup> reported 58% against the rule astigmatism which is higher than our series. Singh Y.P. and goel V.K.<sup>6</sup> reported 10% against the rule astigmatism. Incidence of oblique astigmatism preoperatively was 7% in this series it is similar to jaffe N.S.<sup>1</sup> 1.7%, Kamlesh *et al.*<sup>4</sup>, Ravindran<sup>3</sup> 1% but Singh and Kumar<sup>2</sup> reported oblique astigmatism as much as 18% in there series. The sex incidence of astigmatism is difficult to assess. P. Flunger and Jamora found at it was more frequent and more marked in women in comparison to their counter parts

males while p. Flaz, Luhl sergiewski, leibowicz noted reverse. Hence it was probable that any difference on account of sex was statistical which is in accordance of the finding of the present study. Regarding age and astigmatism was concerned, it was reported that corneal astigmatism is with the rule in young eyes there is shift toward against the rule astigmatism with advancing age. The reasons for that are not cleared. It has been suggested that the upper and lower eye lids compress the upper and lower portion of cornea, thus increasing the curvature of vertical meridian. The effect is lessened with increasing rigidity of the globe. The elevations of intraocular pressure have been associated with a shift towards against the rule astigmatism. The finding of our study were more or less similar to the findings of various studies conducted across the globe by various authors from time to time

**CONCLUSION**

Corneal astigmatism less than 1D was present in most cataract patients with slight differences between the various age ranges. This information is useful for surgeons to change the surgical techniques to minimize the postoperative Astigmatism.

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