

Monofocals Vs Multifocal IOLS of Same Material and Design in Postcataract Extraction Visual Rehabilitation of Patients

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Abstract

Cataract is the commonest eye disorder and affects many individuals globally. The removal of crystalline lens and replacing it with an artificial intraocular lens is the safest and effective surgical treatment of cataract in modern surgery which aims to prevent vision impairment, prevent blindness and restore the vision of the patient. There are various intraocular lenses which are used to correct the cataract, such as monofocal, bifocal, trifocal / multifocal lenses. The literature stated that the monofocal intraocular lenses improve the patient's vision at 1 focal distance and multifocal intraocular lenses improve the patient's vision at multiple focal distances. The present study aimed to compare the monofocals vs multifocal intraocular lenses of same material and design in post-cataract extraction visual rehabilitation of patients. A total of 50 bilateral post – IOLs implanted cataract eyes were involved in the

present study. The mean age of the study participants was 47.9 ± 6.9 years. The female male ratio was 1.27:1. The present study involved a total of 50 bilateral post – IOLs implanted cataract eyes. The data was analysed and discussed with literature available.

The present study showed that the mean age of the study participants was 47.9 ± 6.9 years. The majority of the patients were females with the female male ratio of 1.27:1. There was no significant difference was observed with mean age and gender of the patients. It was reported that

- 1) Satisfaction with overall V/A is comparable in both the groups.
- 2) Satisfaction with near V/A is better in multifocal group
- 3) Satisfaction with Intermediate V/A is better in multifocal group.

- 4) Satisfaction with Distance V/A is comparable in both groups.
- 5) Dependence of Glasses for Near work is more in monofocal group.
- 6) Dependence of Glasses for Intermediate work is more in monofocal group.
- 7) Dependence of Glasses for Distance is comparable in both the groups.
- 8) Incidence of glare, Starburst & haloes is more in multifocal group.

Based on study performed it is inferred that multifocal IOLs compared to monofocal IOLs result in better uncorrected near vision and a higher proportion of patients who achieve spectacle independence but greater risk of unwanted visual phenomena (that is glare, halos, starbursts).

So choice of IOLs whether monofocal or multifocal has to be tailored according to requirements of our patients.

Keywords: Cataract, IOL, Lenses, Monofocal, Multifocal & Vision.

Introduction

Cataract is the commonest eye disorder and affects many individuals globally. The clouding of the lens of the eye is known as cataract, which leads in impairment of vision and causes blindness. Generally old age people are affected with cataract which results in poor quality of life among them.¹

According to the World Health Report, it was estimated that in about 19.34 million bilaterally blind patients the cause of blindness was age-related cataract. The cataract surgery (phacoemulsification) is the most common surgery performed in ophthalmology to prevent the cataract related blindness.²

The most common patients of cataract are from low economic countries.

Traditionally, the cataract intervention programme was evaluated by the number of cataract operations performed per year. In India a significant increase in cataract operations were observed.^{3,4}

The removal of crystalline lens and replacing it with an artificial intraocular lens is the safest and effective surgical treatment of cataract in modern surgery which aims to prevent vision impairment, prevent blindness and restore the vision of the patient. There are various intraocular lenses which are used to correct the cataract, such as; monofocal, bifocal, trifocal / multifocal lenses. The literature stated that the monofocal intraocular lenses improve the patient's vision at 1 focal distance and multifocal intraocular lenses improve the patients vision at multiple focal distances. Various studies observed that the multifocal lenses improved the near and far vision better than monofocal lenses and also reported the demerits of multifocal lenses that it compromises with contrast sensitivity and night-time driving with unwanted subjective phenomena, such as halos, glare and starbursts.^{5,6}

Thus, the present study was undertaken to compare the monofocal and multifocal intraocular lenses.

Aims and Objectives

To compare the monofocals vs multifocal intraocular lenses of same material and design in post-cataract extraction visual rehabilitation of patients.

Material and methods

Prospective Cross-sectional study on 50 patients divided in 2 groups (25 implanted with monofocal IOL in both eyes and 25 implanted with multifocal IOL in both eyes.) admitted in ASCOMS Hospital Sidhra from March 2021 to August 2022.

Inclusion Criteria

- 1) Patients in age group 40-55 years.

The mean age of the study participants was 47.9±6.9 years. The majority of the patients were females with the female male ratio of

1.27:1. there was no significant difference was observed with mean age and gender of the patients.

Complaints/ Score/Dependence	Satisfaction	Monofocal IOLS (Total 25 Patients)	Multifocal IOLS (Total 25 Patients)	Comments
1) Glare		08 (32%)	21 (84%)	
2) Starburst Phenomenon		07 (28%)	16 (64%)	
3) Halos		06 (24%)	17 (68%)	
4) Satisfaction With Overall V/A		5- 14 (56%) 4- 06 (24%) 3- 02 (08%) 2- 02 (08%) 1- 01 (04%)	12 (48%) 07 (28%) 02 (08%) 03 (12%) 01 (04%)	Comparable
5) Satisfaction For Near V/A.		5- 03 (12%) 4- 01 (04%) 3- 03 (12%) 2- 05 (20%) 1- 13 (52%)	20 (80%) 03 (12%) 02 (08%) 00 00	Better In Multifocal Cohort.

Complaints/ Score/Dependence	Satisfaction	Monofocal IOLS (Total 25 Patients)	Multifocal IOLS (Total 25 Patients)	Comments
6) Glasses For Near Work		5- 22 (88%) 4- 02 (08%) 3- 01 (04%) 2- 00 1- 00	00 00 01 (04%) 04 (16%) 20 (80%)	Dependency More In Monofocal Cohort.
7) Satisfaction For Intermediate V/A.		5- 01 (04%) 4- 03 (12%) 3- 06 (18%) 2- 06 (18%) 1- 09 (36%)	18 (72%) 04 (16%) 03 (12%) 00 00	Satisfaction More In Multifocal Group.
8) Glasses For Intermediate Vision. (Computer Work)		5- 14 (56%) 4- 07 (28%) 3- 01 (04%) 2- 02 (08%) 1- 01 (04%)	00 00 02 (08%) 08 (32%) 15 (60%)	Dependency More In Monofocal Cohort.

Complaints/ Satisfaction Score/Dependence	Monofocal IOLS (Total 25 Patients)	Multifocal IOLS (Total 25 Patients)	Comments
9) Satisfaction For Distance V/A	5- 16 (64%) 4- 05 (20%) 3- 01 (04%) 2- 01 (04%) 1- 02 (08%)	5- 17 (68%) 4- 04 (16%) 3- 02 (08%) 2- 01 (04%) 1- 01 (04%)	Comparable
10) Glasses For Distance	5- 02 (08%) 4- 01 (04%) 3- 01 (04%) 2- 05 (20%) 1- 16 (64%)	5- 02 (08%) 4- 01 (04%) 3- 02 (08%) 2- 03 (12%) 1- 14 (56%)	Comparable

Discussion

The present study involved a total of 50 bilateral post – IOLs implanted cataract eyes. The data was analysed and discussed with literature available.

The present study showed that the mean age of the study participants was 47.9±6.9 years. The majority of the patients were females with the female male ratio of 1.27:1. There was no significant difference was observed with mean age and gender of the patients. Further, it was observed all the post-operative parameters (post-operative parameters, patient’s postoperative responses and vision related quality of life) of monofocal and multifocal lenses were compared as described in Table 1, Table 2 and Table 3 and it was reported that

- 1) Satisfaction with overall V/A is comparable in both the groups.
- 2) Satisfaction with near V/A is better in multifocal group
- 3) Satisfaction with Intermediate V/A is better in multifocal group.
- 4) Satisfaction with Distance V/A is comparable in both groups.
- 5) Dependence of Glasses for Near work is more in monofocal group.

- 6) Dependence of Glasses for Intermediate work is more in monofocal group.
- 7) Dependence of Glasses for Distance is comparable in both the groups.
- 8) Incidence of glare, Starburst & haloes is more in Multifocal group.

In a similar study conducted by Cao Kai, et al. (2019) and Tanabe H, et al. (2020) reported that the multifocal IOL has better performance than monofocal and the provided great vision to the patients but have a higher risk of glare, halo and lower sensitivity.⁵ In another study conducted by Bamdad S, et al. (2022), found that the quality of life (vision related) of patients underwent intraocular lens implantation with multifocal lens were more as compared with patients who received monofocal intraocular implant.⁷

Conclusion

Based on study performed it is inferred that multifocal IOLs compared to monofocal IOLs result in better uncorrected near vision and a higher proportion of patients who achieve spectacle independence but greater risk of unwanted visual phenomena (that is glare,halos,starbursts).

So choice of IOLs whether monofocal or multifocal has to be tailored according to requirements of our patients.

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