

VISUAL OUTCOME IN MULTIFOCAL INTRA OCULAR LENSKarunakar¹, Rajalingam², Lokabi Reddy³, Ananad⁴, Prabhu⁵**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: **AIM:** To study Visual outcome in multifocal intraocular lens. **METHODS:** This is a prospective randomized study conducted at Sarojini Devi Eye Hospital from September 2012 to September 2014 consisting of total 50 patients with senile cataract requiring cataract surgery. These patients were divided randomly into 2 groups 25 patients in each group. In the first group 25 eyes of 25 patients underwent phacoemulsification with monofocal iol implantation and in the 2nd group 25 eyes of 25 patients underwent phacoemulsification with multifocal implantation. Age of the patients ranged from 50 to 70 years. **RESULTS:** Graph 1 shows 11(44%) patients had a UCDVA >6/9 at 1 week post-op in monofocal group. 10(40%) had UCDVA > 6/9 in multifocal group. Graph 2 shows 23(92%) patients had a BCDVA >6/9 at 1 week post-op in monofocal group. 24(96%) had BCDVA >6/9 in multifocal group. Graph 3 shows 20(80%) patients had a UCDVA >6/9 at 6 weeks post-op in monofocal group. 21(84%) had UCDVA > 6/9 in multifocal group. Graph 4 shows 25(100%) patients had a BCDVA >6/9 at 6 weeks post-op in monofocal group and in multifocal group. Graph 5 shows (20%) patients had a UCNVA >N6-N10 at 1 week post-op in monofocal group. 25(100%) had UCNVA > N6-N10 in multifocal group. Graph 6 shows in monofocal group 25(100%) contrast sensitivity >20%, multifocal group had only 10(40%) patients >20% contrast sensitivity. **CONCLUSION:** In our study there is no significant difference in uncorrected distant visual acuity after 1 and 6 weeks post operatively in both the groups. However there was significant difference in the uncorrected near visual acuity. There was no difference in the corrected near visual acuity in both the groups.

KEYWORDS: Uncorrected distant visual acuity (UCDVA), Best corrected distant visual acuity (BCDVA), Multifocal Intraocular lenses (IOL), Monofocal IOLs.

INTRODUCTION: The evolution of the cataract surgery with the introduction of intraocular lens implantation has been one of the major achievements of modern medicine. The intraocular lenses provide a precise pseudophakic optical rehabilitation with minimal magnification and excellent optical properties. The advent of small incision surgery made possible by phacoemulsification and foldable IOLs represents another major milestone in cataract surgery.^[1-3] Monofocal lenses have a single focus, which does not allow good spectacle free vision for both distance and near.^[4] Over the past decade, a variety of multifocal intraocular lenses (MFIOLs) have been introduced and enjoyed a widespread clinical use. Both refractive and diffractive models have been shown to be effective in allowing each eye to achieve quality, uncorrected distance and near acuity after cataract surgery. The major concern with use of these lenses are loss of contrast sensitivity and the inducement of glare and halos from light sources during night vision.^[5]

AIMS AND OBJECTIVES: The study was carried out with aim of comparing multifocal iols with current standard treatment of monofocal iols in respect to;

1. Distant visual acuity (Uncorrected and best corrected distant visual acuity) UCDVA and BCDVA.
2. Near visual acuity (Uncorrected and best corrected near visual acuity) UCNVA and BCNVA.

3. Contrast sensitivity.

MATERIALS AND METHODS:

- This is a prospective randomized study conducted at Sarojini Devi eye hospital from September 2012 to September 2014 consisting of total 50 patients with senile cataract requiring cataract surgery.
- These patients were divided randomly into 2 groups 25 patients in each group.
- In the first group 25 eyes of 25 patients underwent phacoemulsification with monofocal iol implantation and in the 2nd group 25 eyes of 25 patients underwent phacoemulsification with multifocal implantation.
- Age of the patients ranged from 50 to 70 years.

METHODS:

- Uncorrected distant visual acuity and corrected distant visual acuity by snellens chart.
- Iol power calculation by keratometry and a scan biometry using SRK T formula.
- Near visual acuity was tested after correcting distant visual acuity. Near visual acuity testing was done using snellens near vision test types at a distance of 40cm.
- Visual acuity is converted into log MAR for statistical analysis and is presented in decimal scale.
- Contrast sensitivity was tested using appasamy contrast sensitivity chart at 6m distance 'optotype was equivalent to 6/12 snellen visual acuity. The letters are printed with black ink on white paper.
- Contrast is gradually reduced in following order (100%, 80%, 60%, 40%, 30%, 20%, 10%).

Inclusion Criteria:

1. Patients with senile and pre senile cataract without any other ocular pathology.
2. Patients not having inclination to near post-operative glasses.
3. Cases with intra operative and post-operative complications.

Exclusion Criteria:

1. Complicated cataract.
2. Eye diseases with systemic diseases like glaucoma, diabetes, retinal pathology.

RESULTS: Graph 1 shows 11(44%) patients had a UCDVA >6/9 at 1 week post-op in monofocal group. 10(40%) had UCDVA > 6/9 in multifocal group. Graph 2 shows 23(92%) patients had a BCDVA >6/9 at 1 week post-op in monofocal group. 24(96%) had BCDVA > 6/9 in multifocal group. Graph 3 shows 20(80%) patients had a UCDVA >6/9 at 6 weeks post-op in monofocal group. 21(84%) had UCDVA > 6/9 in multifocal group. Graph 4 shows 25(100%) patients had a BCDVA >6/9 at 6 weeks post-op in monofocal group and in multifocal group. Graph 5 shows (20%) patients had a UCNVA >N6-N10 at 1 week post-op in monofocal group. 25(100%) had UCNVA >N6-N10 in multifocal group. Graph 6 shows in monofocal group 25(100%) contrast sensitivity >20%, multifocal group had only 10(40%) patients >20% contrast sensitivity.

DISCUSSION: Distant Visual Acuity;

- 11(44%) patients had an UDVA >6/9 in monofocal group at 1st week (mean 0.18 logMAR). At the end of 6 weeks follow up 20(80%) of patients had a UDVA >6/9 (mean 0.14 logMAR).
- 10(40%) patients had an UDVA >6/9 in multifocal iol group at 1st week (0.15 logMAR). At the end of 6 weeks follow up 21(84%) patients had a UDVA of >6/9(mean 0.09 logMAR).
- At the end of the 1st week follow up 23(92%) monofocal group patients had a BCDVA of >6/9(mean 0.12 log MAR). At the end of 6 weeks follow up 25(100%) patients had a BCDVA of >6/9 (mean 0.03 logMAR).
- 24(96%) patients had BCVA of >6/9 in multifocal group at 1st week (Mean 0.06logMAR) and 6th week (mean 0.01 log).
- There was no significant difference in both the groups $p>0.01$ during follow period which was the same in hashemi et al.study in which mean UDVA and BDVA was 0.14 and 0.05 logmar respectively in the monofocal group and 0.01 and 0.04 logmar respectively in the multifocal iol group.
- cillino et al. study; Chiami et al. study; ortiz et al. study; were in consistent with our study.^[6]

Near Visual Acuity:

- 15(60%) patients had UCNVA>N12 (mean 0.2 logMAR) at 1st week post operatively in monofocal iol group.
- 25(100%) patients had UCNVA>N12 (mean 0.1 logMAR) at 1st week post operatively which was statistically significant $p<0.001$.
- Studies done by Ortiz et al.;cillino et al.; chiam et al.; hashemi et al.; showed that multifocal iols improve UCNVA , which were consistent with our study.^[7,8]
- Contrast sensitivity.
- Contrast sensitivity in our study was lower in multifocal group which was similar in other studies.

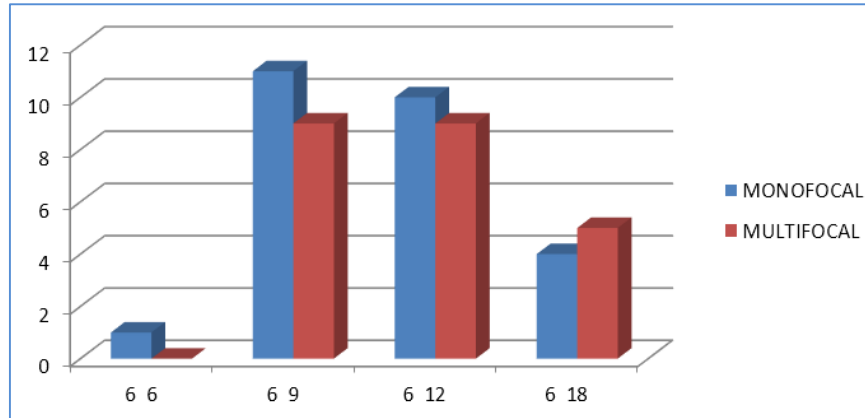
CONCLUSION:

- In our study there is no significant difference in uncorrected distant visual acuity after 1 and 6 weeks post operatively in both the groups.
- However there was significant difference in the uncorrected near visual acuity. There was no difference in the corrected near visual acuity in both the groups.

UCDVA	MONOFOCAL	MULTIFOCAL
6/6-6/9	11	10
6/12	10	10
≥6/18	4	5
TOTAL	25	25

Table 1: Post-Operative Uncorrected Distant Visual Acuity At 1 Week

ORIGINAL ARTICLE

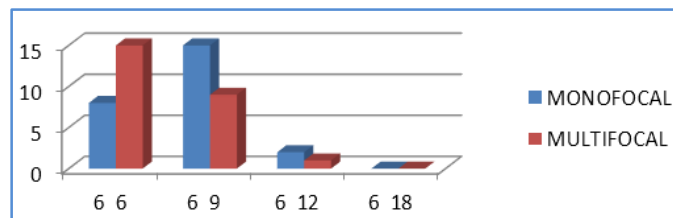


Graph 2: Post-Operative Uncorrected Distant Visual Acuity at 1 Week

11(44%) patients had a JCDVA >6/9 at 1 week post-op in monofocal group. 10(40%) had UCDVA > 6/9 in multifocal group.

UCDVA	MONOFOCAL	MULTIFOCAL
6/6-6/9	23	24
6/12	2	1
≥6/18	0	0
TOTAL	25	25

Table 2: Post-Operative Best Corrected Distant Visual Acuity At 1 Week



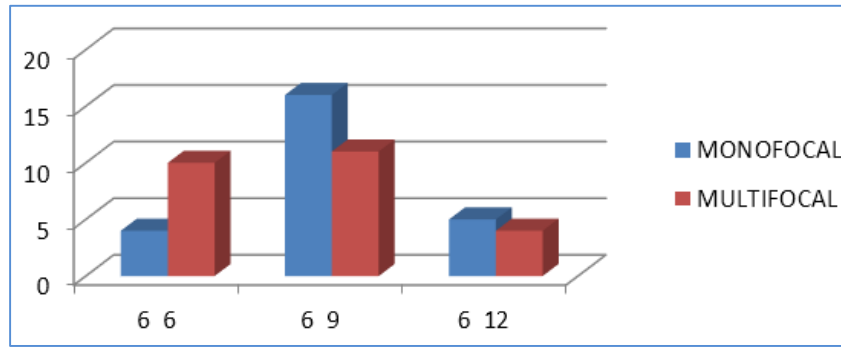
Graph 2: Post-Operative Best Corrected Distant Visual Acuity at 1 Week

23(92%) patients had a BCDVA >6/9 at 1 week post-op in monofocal group. 24(96%) had BCDVA > 6/9 in multifocal group.

UCDVA	MONOFOCAL	MULTIFOCAL
6/6-6/9	20	21
6/12	5	4
≥6/18	0	0
TOTAL	25	25

Table 3: Post-Operative Un-Corrected Distant Visual Acuity At 6 Weeks

ORIGINAL ARTICLE

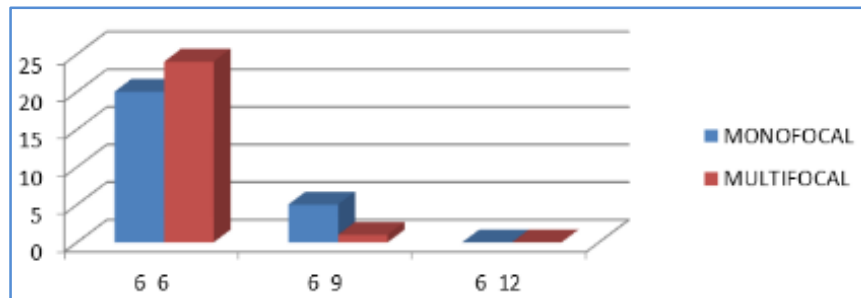


Graph 3: Post-Operative Uncorrected Distant Visual Acuity at 6 Weeks

20(80%) patients had a UCDVA >6/9 at 6 weeks post-op in monofocal group. 21(84%) had UCDVA > 6/9 in multifocal group.

BDCVA	MONOFOCAL	MULTIFOCAL
6/6	20	24
6/9	5	1
TOTAL	25	25

Table 4: Post-Operative Best Corrected Distant Visual Acuity at 6 Weeks



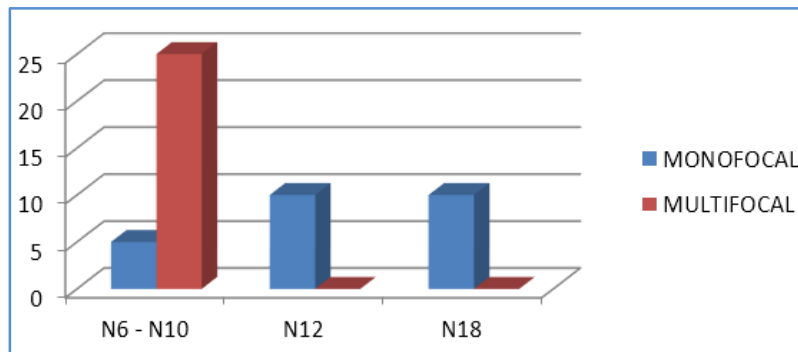
Graph 4: Post-Operative Best Corrected Distant Visual Acuity at 6 Weeks

25(100%) patients had a BCDVA >6/9 at 6 weeks post-op in monofocal group and in multifocal group.

UCNVA	MONOFOCAL	MULTIFOCAL
N6-N10	5	25
N12	10	0
N18	10	0
TOTAL	25	25

Table 5: Post-Operative Uncorrected Near Visual Acuity at 1 Week

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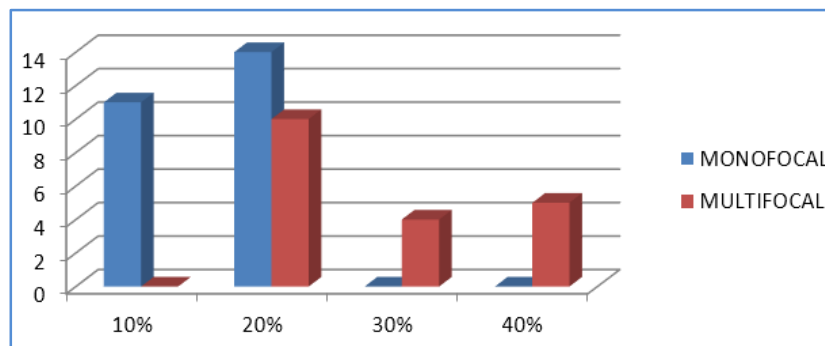


Graph 5: Post-Operative Uncorrected Near Acuity at 1 Week

5(20%) patients had aUCNVA >N6-N10 at 1 week post-op in monofocal group. 25(100%) had UCNVA > N6-N10 in multifocal group.

CONTRAST SENSITIVITY	MONOFOCAL	MULTIFOCAL
10%	11	0
20%	14	10
30%	0	4
40%	0	11
TOTAL	25	25

Table 6: Contrast Sensitivity



Graph 6: Contrast Sensitivity

In monofocal group 25(100%) contrast sensitivity >20%, multifocal group had only 10(40%) patients >20% contrast sensitivity.

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