

The Comparative Study of Efficacy and Safety of Phacoemulsification And Manual Small Incision Cataract Surgery (MSICS) at S. P. Medical College Bikaner

Vimla Beniwal¹, Anita Chahar², Jaishree Murali Manohar^{3*}, Kalpana daga⁴, Jitendra Acharya⁵

¹Junior Specialist, ²Ex- Professor, ³Professor & Head, ⁴Professor, Department of Ophthalmology, S. P. Medical College, Bikaner, Rajasthan, India.

⁵Senior Demonstrator, Department of Dentistry, S. P. Medical College, Bikaner, Rajasthan, India.

ABSTRACT

Introduction: In 2002, WHO estimated that blindness affected 37 million people globally. If efforts are not increased to treat avoidable blindness worldwide this is projected to increase to 76 million by the year 2020. To address this issue of increasing blindness, in 1999 the WHO and the International agency for the prevention of blindness launched a global initiative called "vision 2020" the "right to sight" to eliminate avoidable blindness by the year 2020. An estimated 4 million people experience blinding cataract every year in India.

Materials and Methods: It comprises 60 patients of senile cataract, aged 40 yrs. or above and both male and female (also cases with controlled DM and HT). Informed consent for the surgery & study was taken. The eligible patients were divided into two groups (A and B) randomly. All patients were undergone either manual small incision cataract surgery (MSICS) or phacoemulsification with PCIOL surgery under local anesthesia (LA) by the faculty.

Results: Observations of the present study are based on a 6 weeks follow up of 60 cases, which had undergone cataract extraction with PCIOL either with MSICS or Phacoemulsification. This study is done to compare visual outcomes and complications in both the MSICS and phacoemulsification so as to use a procedure which is

economically viable with good visual outcome and less complication to reduce blindness due to cataract.

Conclusion: On the basis of this study, it was concluded that Manual small-incision cataract surgery (MSICS) is comparable to Phacoemulsification for the rehabilitation of the patient with cataract, although the phacoemulsification technique gives better uncorrected visual acuity in a slightly larger proportion of patients at 6th weeks


Keywords: Phacoemulsification, MSICS, PCIOL, Local Anesthesia.

*Correspondence to:

Dr. Jaishree Murali Manohar,
Professor & Head,
Department of Ophthalmology,
S. P. Medical College, Bikaner, Rajasthan, India.

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INTRODUCTION

In 2002, WHO estimated that blindness affected 37 million people globally.¹ If efforts are not increased to treat avoidable blindness worldwide this is projected to increase to 76 million by the year 2020.² To address this issue of increasing blindness, in 1999 the WHO and the International agency for the prevention of blindness launched a global initiative called "vision 2020" the "right to sight" to eliminate avoidable blindness by the year 2020. An estimated 4 million people experience blinding cataract every year in India.³ Nearly 4 million cataract surgeries are performed in India annually, but only a small proportion of these are performed on patients who are blind because of cataract.⁴

In developing countries insufficient financial resources, inaccessibility and lack of awareness about existing eye care facilities are some of the barriers, people face in utilizing available eye care facilities. (Melese et al 2004, de Lime et al 2005,

Sapkota et al 2004). Several studies have brought attention to the advantages and disadvantages of various surgical approaches to cataract surgery in developing countries Throughout the first four decades of the 20th century, ICCE was the predominant form of lens removal worldwide.⁵ As patients remain aphakic after ICCE, aphakic spectacles must be worn for optical correction.⁶ In India approximately 5 million cataract surgery are performed per year. Conventional extra capsular cataract extraction (ECCE), manual small incision cataract surgery and phacoemulsification are the three most popular form of cataract surgery in India and rest of the world. In conventional ECCE lens nucleus is removed through a large (approximately 12 mm) incision. Disadvantages of this procedure like delayed visual rehabilitation, large surgically induced astigmatism and suture related complications made surgeons to think of alternative procedure.

MATERIALS AND METHODS

This is a randomized single site study which was done in the Department of Ophthalmology, S.P. Medical College, Bikaner. It comprises 60 patients of senile cataract, aged 40 yrs. or above and both male and female (also cases with controlled DM and HT). Informed consent for the surgery & study was taken. The eligible patients were divided into two groups (A and B) randomly. All patients were undergone either manual small incision cataract surgery (MSICS) or phacoemulsification with PCIOL surgery under local anesthesia (LA) by the faculty.

Group A (n=30) has undergone MSICS with single piece PMMA PCIOL surgery under LA. Group B (n=30) has undergone phacoemulsification with foldable PCIOL surgery under LA.

Inclusion Criteria

1. Senile cataract
2. Age 40 to 90 years
3. Controlled DM
4. Controlled HT

Exclusion Criteria

1. Patients with fuchs' dystrophy, macular degeneration, glaucoma,

uveitis, pseudoexfoliation (PEX), corneal pathology, Diabetic Retinopathy and any other Intra ocular pathology.

2. Traumatic and subluxated cataract
3. Previous intraocular surgery in same eye
4. Patient who are not suitable for follow-up visits.

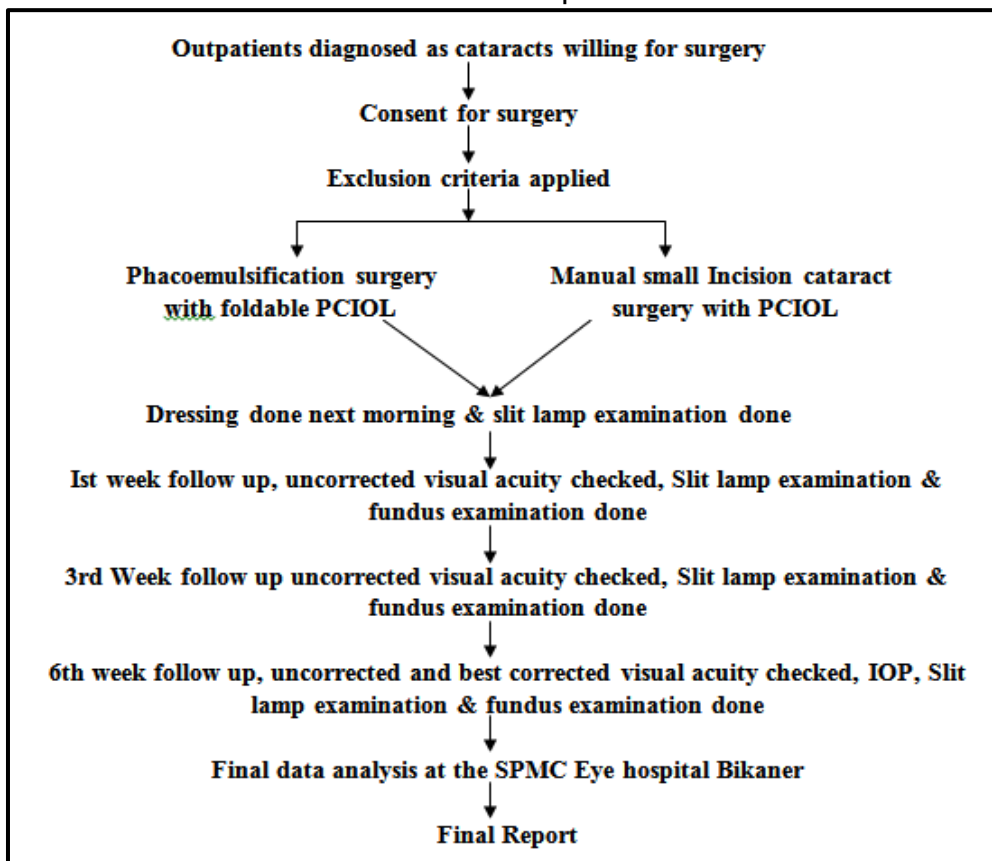
Preoperative Examination

Patients were examined thoroughly preoperatively. Diabetic and hypertensive patients were taken for surgery, only after proper control of disease. Patients were examined for visual acuity (VA) both UCVA and BCVA, IOP, slit lamp examination, fundus examination, keratometry (AR) & A-scan. Routine investigations for surgery like BP, FBS, HB, BT, CT, and Urine for albumin and sugar were done.

Postoperative Examination

Postoperative Examination was performed at -Day 1, 1st week, 3rd Week & 6th Week. It included visual Acuity both distant and near (uncorrected visual acuity) UCVA at 1st week and 3rd Week, (corrected and uncorrected) both UCVA and BCVA at 6th Week, slit lamp examination of anterior segment and fundus examination at every visit, and IOP (Shiotz tonometer) at 6th weeks.

Flowchart for Follow-Up of Patient



OBSERVATIONS

Observations of the present study are based on a 6 weeks follow up of 60 cases, who had undergone cataract extraction with PCIOL either with MSICS or Phacoemulsification. The study was conducted from September 2010 to April 2011 at Department of Ophthalmology, S.P Medical College, Bikaner. This study is done to compare visual outcomes and complications in both the MSICS and phacoemulsification so as to use a procedure which is economically viable with good visual outcome and less complication to reduce blindness due to cataract.

P value is 0.114, 0.438 & 0.22 (non-significant) in uncorrected visual acuity group 6\9 – 6\12, 6\18 – 6\24 and 6\36 – 6\60 respectively, means there was no statistically significant difference in uncorrected visual acuity (UCVA) in cases of group A and group B. P value is 0.117 and 0.070 (non-significant) in uncorrected visual acuity group 6\9 – 6\12 and 6\18 – 6\24 respectively, means there was no statistically significant difference in uncorrected visual acuity (UCVA) in cases of group A and group B. P value is 0.129 and 0.04 in uncorrected visual acuity group 6\9 – 6\12 and 6\18 – 6\24 respectively, means uncorrected

visual acuity (UCVA) in cases of group B was significantly better than group A at 6th week post operatively. P value is 0.129(non-significant) in best corrected visual acuity group 6\6- 6\9 means there was no statistically significant difference in best corrected visual acuity (BCVA) in cases of

group A and group B. There were no significant differences in Intra Operative & Post-Operative Complications in both groups. P value is 0.58 (non-significant) means there was no statistically significant difference in changes in Intraocular Pressure (IOP) in cases of group A and group B.

Table 1: Distribution of cases according to uncorrected visual acuity (UCVA) recorded on 1st week post-operative [in both group A (MSICS, n = 30) and group B (Phaco, n = 30)]

Uncorrected visual acuity (UCVA)	Group A (MSICS) (n = 30)		Group B (Phaco) (n = 30)		Statistical data
	No. of cases	%	No. of cases	%	
6\9 – 6\12	09	30	15	50	$\chi^2 = 2.49 [P=0.114]$
6\18 – 6\24	16	53.3	13	43.3	$\chi^2 = 0.60 [P=0.438]$
6\36 – 6\60	05	16.7	02	6.66	$\chi^2 = 1.45 [P=0.22]$
< 6\60	0	00	0	00	
Total no. of cases	30	100	30	100	

Table 2: Distribution of cases according to uncorrected visual acuity (UCVA) recorded on 3rd week post-operative [in both group A (SICS, n = 30) and group B (Phaco, n = 30)]

Uncorrected visual acuity (UCVA)	Group A (MSICS) (n = 30)		Group B (Phaco) (n = 30)		Statistical data
	No. of cases	%	No. of cases	%	
6\9 – 6\12	21	70	26	86.7	$\chi^2 = 2.45 [P=0.117]$
6\18 – 6\24	07	23.3	02	6.66	$\chi^2 = 3.26 [P=0.070]$
6\36 – 6\60	02	6.66	02	6.66	
< 6\60	0	00	0	00	
Total no. of cases	30	100	30	100	

Table 3: Distribution of cases according to uncorrected visual acuity (UCVA) recorded on 6th week post-operative [in both group A (MSICS, n = 30) and group B (Phaco, n = 30)]

Uncorrected visual acuity (UCVA)	Group A (MSICS) (n = 30)		Group B (Phaco) (n = 30)		Statistical data
	No. of cases	%	No. of cases	%	
6\9 – 6\12	24	80	28	93.3	$\chi^2 = 2.30 [P=0.129]$
6\18 – 6\24	06	20	01	3.33	$\chi^2 = 4.04 [P=0.04]$
6\36 – 6\60	0	00	01	3.33	
< 6\60	0	00	0	00	
Total no. of cases	30	100	30	100	

Table 4: Distribution of cases according to best corrected visual acuity (BCVA) recorded on 6th week post-operative [in both group A (MSICS, n = 30) and group B (Phaco, n = 30)]

Best corrected visual acuity (BCVA)	Group A (MSICS) (n = 30)		Group B (Phaco) (n = 30)		Statistical data
	No. of cases	%	No. of cases	%	
6\6- 6\9	24	80	28	93.33	$\chi^2 = 2.30 [P=0.129]$
6\9p – 6\12	06	20	0	00	
6\18 – 6\24	0	00	01	3.33	
6\36 – 6\60	0	00	01	3.33	
Total no. of cases	30	100	30	100	

Table 5: Intra Operative & Post-Operative Complications

Complications	MSICS	Phaco
PC tear	0	02
Iridodialysis	01	0
Shallow AC on day 1	0	01

Table 6: Changes in IOP recorded on 6th post-operative week in cases of Group A & Group B

IOP in mm of Hg	Group A		Group B		Total	Statistical Data
<14.6	0	0	0	0	0	
14.6-17.3	9	30	11	36.67	20	$\chi^2 = 0.30 [p= 0.58]$
18.9-20.6	21	70	19	63.33	40	$\chi^2 = 0.30 [p= 0.58]$
>20.6	0	0	0	0	0	

DISCUSSION

Cataract is the commonest cause of avoidable blindness worldwide,⁷ and cataract surgery is the commonest procedure performed in ophthalmology. Cataract surgery is also one of the most cost-effective surgical interventions in terms of the quality of life restored.⁷ It is fast, relatively risk free, does not need admission or general anesthesia and yet gives dramatic recovery compared to the preoperative condition. Techniques of cataract surgery have changed dramatically in the past three decades. Sir Stewart Duke Elder mentioned intracapsular cataract extraction (ICCE) as the surgery of choice in his venerable tome in 1967 and was not impressed by the new technique called phacoemulsification (Phaco).⁸ That would be hearsay today.

The aim of this study was to study the efficacy and safety of phacoemulsification and manual small incision cataract surgery (MSICS) and compare both methods.

Uncorrected Visual Acuity (UCVA) (table 1, 2, 3)

UCVA recorded on 7th post-operative day with the help of Snellen's visual acuity chart for distant vision –83.3 %cases of group A and 93.3 % cases group B had uncorrected visual acuity \geq 6/24. In study by P M Gogate 131 out of 192 (68.2%) of Phaco group and 117 of 191 (61.3%) of MSICS group had uncorrected visual \geq 6/18 at 1st week follow-up ($P=0.153$) correlated with our study. UCVA recorded on 3rd post-operative week-

There was no statistically significant difference in uncorrected visual acuity (UCVA) in cases of group A and group B (P value =0.117 & $p=0.070$ non-significant) in uncorrected visual acuity group 6/9 – 6/12 and 6/18 – 6/24 respectively.

Our findings were similar to study of safety and efficacy of phacoemulsification compared with MSICS by a randomized clinical trial by Gogate P M et al , 81.08% patients of Phaco and 71.1% patients of MSICS group ($P=0.038$) were better than or equal to 6/18 at 6th week follow-up.

Best Corrected Visual Acuity (BCVA) (table 4)

BCVA recorded on 6th post-operative week (with help of Snellen's visual acuity chart for distant vision). There was no statistically significant difference in best corrected visual acuity (BCVA) in cases of group A (80 %) and group B (93.33 %). (P value= 0.129 (non-significant) in best corrected visual acuity group 6/6– 6/9).

Our finding correlated with study conducted by Rengaraj V. et al to compare the safety and efficacy of phacoemulsification and manual small-incision cataract surgery (SICS) to treat white cataracts in southern India, corrected (CDVA) distance visual acuities was 20/60 or better in 112 (99.0%) and 115 (98.2%), in Phaco and MSICS group respectively ($P=0.59$).

There were no significant difference in Intra Operative & Post-Operative Complications in both groups. Group B had two PC tear during surgery and one case had shallow AC on first post-operative day while Group A had one case of iridodialysis.(table 5) The above observations revealed that MSICS is comparable to phacoemulsification for the rehabilitation of the patient with cataract, although the phacoemulsification technique gives better uncorrected visual acuity in a slightly larger proportion of patients at 6th weeks. MSICS is safe and nearly as effective as phacoemulsification.⁹

Changes in (IOP) Intraocular Pressure (table 6)

It was recorded on 6th post operative week with schiotz tonometer - In both groups all cases had IOP in a range of 14.6 – 20.6 mm of Hg with schiotz tonometer with 5.5 gm weight, which is within

normal limit. P value = 0.58 (non-significant) means there was no statistically significant difference in changes in Intraocular Pressure (IOP) in both groups. This criteria was also not taken previously.

CONCLUSION

On the basis of this study, it was concluded that Manual small-incision cataract surgery (MSICS) is comparable to Phacoemulsification for the rehabilitation of the patient with cataract, although the phacoemulsification technique gives better uncorrected visual acuity in a slightly larger proportion of patients at 6th weeks. MSICS is safe and nearly as effective as phacoemulsification.

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