



Original Research Article

A randomized comparative study of visual outcome and complications following manual small incision cataract surgery and phacoemulsification

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ABSTRACT

Introduction: Objective of the study was to measure the difference in the visual outcome and complications following manual small incision cataract surgery and phacoemulsification and to suggest on the most appropriate treatment option in developing countries.

Materials and Methods: The sample comprised of 50 eyes from 50 patients in this study. From the total of 50 patients, 25 patients were enrolled into MSICS and 25 into phacoemulsification. They were studied for a period of 5 months. They were asked to review on immediate post-operative day 1, 2nd week and 6th week.

Results: In this study 54% were women and 46% were men. The commonest age group was between 51-60. The BCVA of 6/9-6/6 obtained was 72% in the MSICS group and 80% in phacoemulsification group. In MSICS group 52% and in phacoemulsification group 42% had no complications. The most common complication in MSICS was surgically induced astigmatism (24%) and PCR (24%) in phacoemulsification.

Conclusion: The visual outcome attained by both MSICS and phacoemulsification were statistically similar with low complication rates. MSICS being faster, safer and low technology dependent can be accepted as an alternative to phacoemulsification.

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1. Introduction

The cataract is the most common cause of reversible blindness in the world. It is nothing but clouding of lens due to senility.¹ In the present scenario cataract is treatable either through Manual small incision cataract surgery or phacoemulsification and replacing cataractous lens with intraocular lens.² Manual small incision cataract surgery (MSICS) requires 5.5-7mm incision and various instruments to remove cataractous lens. Phacoemulsification requires incision of size 2.2-2.8 mm which uses high frequency probe to fragment the nucleus followed by IOL implantation.¹ In order to tame the overload of cataract blindness in the developing world, there must be adequate surgical coverage and cost effective surgical procedures available which gives good visual outcomes² early visual restoration³ and with minimal complications.

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Phacoemulsification is more popular in the industrialized countries in the recent years.^{4,5} The reasons for this popularity are that phacoemulsification gives better vision,² and emmetropia later. This is not appropriate for middle income countries which have an ample number of cataract patients requiring surgery, because of high costs, high technology dependent, maintenance and staff wages.^{4,5} So it is crucial to search for the more cost effective options in low income countries.

2. Objectives

1. To measure the visual outcome following cataract surgery.
2. To compare the complications following cataract surgery.
3. To suggest on the most appropriate treatment options in developing countries like India.

3. Material and Methods

On approval from the ethical committee, a study was conducted on patients who have undergone either phacoemulsification or manual small incision cataract surgery during the period of 5 months from April 2018 to August 2018) fulfilling the inclusion/exclusion criteria in the department of ophthalmology in Rajarajeswari medical college and hospital, Bangalore. The sample comprised of 50 patients in this study. From the total of 50 patients, 25 patients were enrolled into MSICS and 25 into phacoemulsification. The distribution was done by randomisation. They were studied for a period of 5 months. They were asked to review on immediate post-operative day 1, 2nd week and 6th week. The selected 50 patients with cataract (mature, immature and hyper mature cataract) attending the ophthalmology OPD at Raja Rajeswari medical college and hospital were randomly taken for the study. Patients with the age of above 50 years with unilateral or bilateral cataract were re selected and examined. Written approval was obtained from the patients who were selected for the procedure. Detailed history was taken. Visual acuity was assessed with snellen's chart. Anterior segment evaluation was done by slit lamp. Intraocular pressure was measured using Non-contact tonometry or applanation tonometry. Fundoscopy was done using 78D lens and indirect ophthalmoscope. Basic routine investigations like RBS, SEROLOGY was done. Written informed consent was taken once surgery is planned. Patients were reviewed on the immediate 1st post-operative day, 2nd week and 6th week subsequently.

3.1. Inclusion criteria

1. Patients ready to give consent.
2. Patients more than 50 years of age irrespective of the sex.
3. Patients with no corneal pathology.
4. Patients with no posterior segment pathology.

3.2. Exclusion criteria

1. Patients reluctant to give consent.
2. Patients who are unable to attend the follow-up visits.
3. Patients with co-existing glaucoma, corneal pathology, uveitis, poor pupil dilation (5.0 mm), and other known pathology that could impair visual outcome.
4. Patients with subluxated and traumatic cataract, complicated cataract.

4. Results

Out of 50 patients selected for the study, 25 patients underwent MSICS and 25 patients underwent phacoemulsification. The commonest age group was between 51-60 (Figure 2). There were more women 54% (n=30) than

men 46% (n=20) in this study (Figure 1). The distribution was done on randomisation. On the immediate 1st post operative day 34% had UCVA of 6/9 -6/6 where as 44% in phaco group had the same vision. The UCVA of 6/18-6/12 was obtained by 48% of patients in MSICS group and 34% of patients in phaco group and only 18% and 22% had The UCVA of 6/60-6/24 was attained by 18% of patients in MSICS group and 22% in phaco group respectively (Figure 3). During 2nd week visit, half the patients (50%) in MSICS group and more than half (64%) had UCVA of 6/9-6/6. The MSICS group had almost equal number of patients (24% and 26%) with UCVA of 6/60-6/24 and 6/18-6/12 whereas in phaco group 28% and 8% had the same UCVA respectively (Figure 4). The MSICS group accounted for 72% and phaco group accounted for 80% with BCVA of 6/9-6/6 at the end of 6 weeks (Figure 5). Nearly half of the patients had no complications in MSICS group.

The percentage of patients with no complications in phaco group accounts for 42%. The major complication in M SICS group was surgically induced astigmatism 22% followed by post-operative uveitis 18%. Others were being corneal edema 8% and posterior capsular 4% (Figure 6). The most common complication in phaco was PCR (24%). Other complications include corneal edema (16%) and post op uveitis 18% (Figure 7).

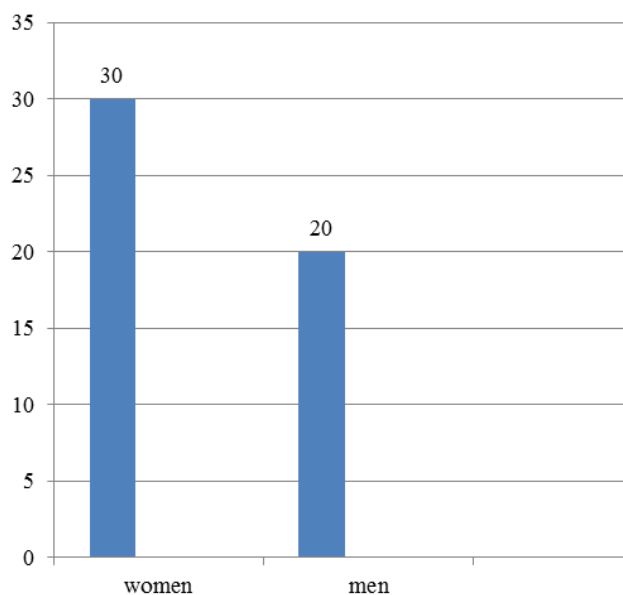


Fig. 1: Gender distribution in the study.

5. Discussion

The mean age group of studied population is 55. The male and the female distribution were 20:30 in this study. The parameters such as visual outcome and complications of both the surgeries were studied and statistically compared

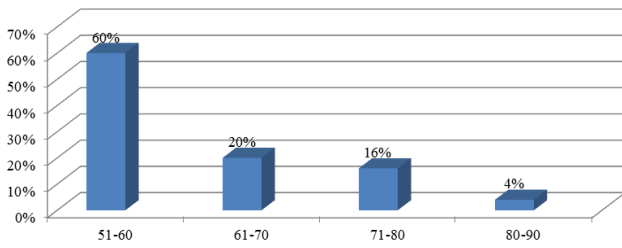


Fig. 2: Age distribution in the study

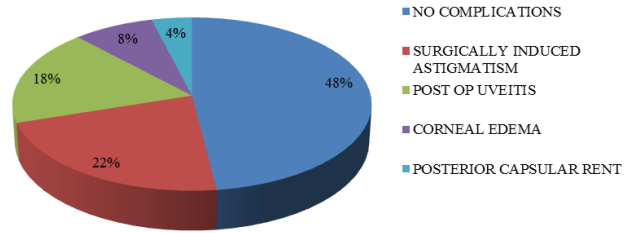


Fig. 6: Complications encountered in MSICS group

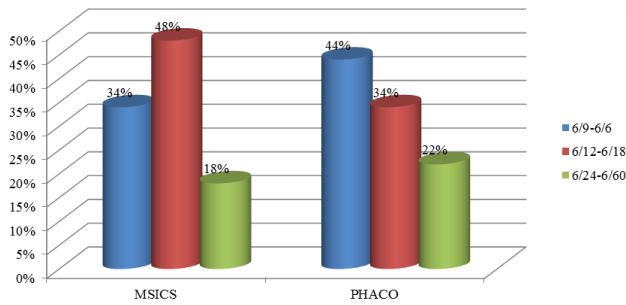


Fig. 3: Uncorrected visual acuity in the immediate 1st post-operative day in MSICS group and in phaco group

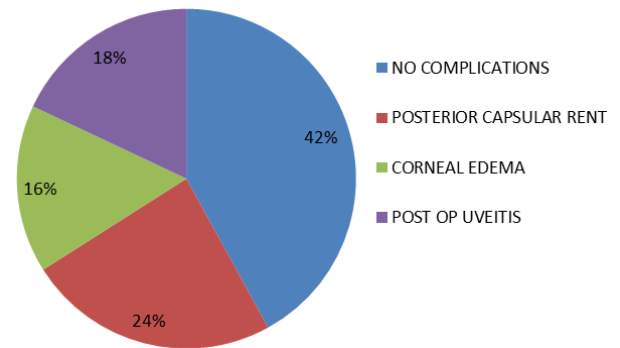


Fig. 7: Complications encountered in phaco group

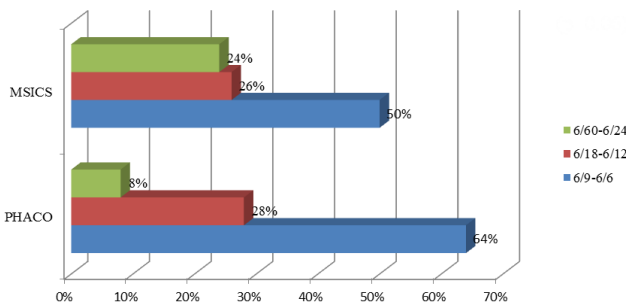


Fig. 4: Uncorrected Visual acuity in the 2nd week

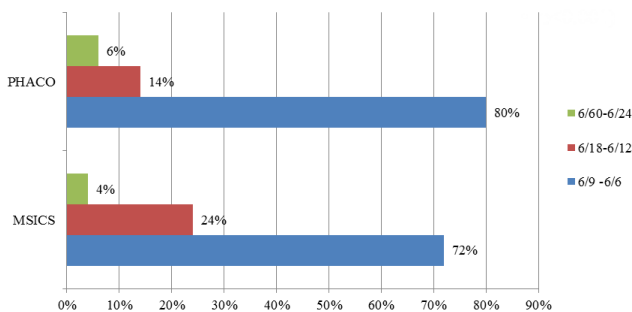


Fig. 5: Best corrected Visual acuity at the end of 6th week

to determine the significant difference between. The phaco group excelled MSICS group on the 1st day in terms of Uncorrected Visual acuity (p=0.09). At 2nd week, phaco again excelled MSICS. (p=0.06). The BCVA were almost equal in both the cases at the end of 6th week (p<0.001). The most common complications in both the groups was found to be post op iritis (22%) in MSICS and PCR (24%) in phaco. (p<0.001) In both the groups, the visual outcome and complications were almost same with no undue advantages of phaco over MSICS at 6th week.

Gogate et al⁶ compared phacoemulsification vs MSICS by randomization in terms of welfare, effectiveness and astigmatic change. From his study he concluded that at 1st week the UCVA of 6/18 or better was attained by 61.25% in MSICS group and 68.2% patients in phaco emulsification group. At 6th week there was a 10% difference between the two groups in attaining (81.08 % and 71.1% in phaco and MSICS) the UCVA 6/18 or better. Phacoemulsification group was exceptionally good in achieving the better visual acuity. From this study he concluded that both the procedures are safe to the same degree and achieved excellent visual outcomes following cataract surgery. Singh et al⁷ compared MSICS vs phaco terms of complications and effectiveness in immature cataract patients. On 1st post operative day SICS group had good visual outcome than phaco group stating that SICS is an apt procedure for immature cataracts.

Venkatesh et al⁵ compared white cataracts by randomization. He concluded that MSICS and phacoemulsification were equally good in terms visual outcome and complications. But MSICS being safer and, cost effective than phaco emulsification It is proved to be an alternative in the developing countries for mature cataract. Cook et al⁸ compared visual outcome with equal number of patients by randomisation. On day 1, visual outcomes were equal in both the groups. After 8 weeks, phaco outstood MSICS in achieving good UCVA and CVA. He stated that MSICS is replaceable to phaco in developing and under developed countries. MSICS has unavoidable intra-operative and post-operative complications sometimes. The excessive meddling inside the anterior chamber can damage the endothelium, iris prolapse, striate keratitis, and posterior capsular rent. Surgically induced astigmatism is one of crucial factors responsible for good visual outcome and early rehabilitation following MSICS surgery. It mainly depends on the size, site, type of the incision. So surgeons should prefer an incision which gives less surgically induced astigmatism following cataract surgery.

A skilled and experienced surgeon will have minimal or no postoperative inflammation and corneal edema following surgery. The commonest complications in phaco are posterior capsule rent with or without vitreous loss and phaco burn. The corneal edema and post op uveitis depends on the phaco time i.e. from the entry to exit of the phaco probe. But the surgeon should consider posterior capsular opacifications later, that needs to be treated with ndyag laser.^{9,10}

6. Conclusion

From this study both MSICS and phaco were equally comparable with each other in terms of visual outcome and complications. But MSICS being faster, safer, with less learning curve, cost effective and less technology dependent can be accepted as an alternative to phaco emulsification in the developing world.

7. Source of Funding

None.

8. Conflict of Interest

None.

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