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Original Article

Comparison of Complications between Manual Small Incision Cataract Surgery and Phacoemulsification

Israr Ahmad Bhutto[1], Maria Nazish Memon[2], Irshad Ali[3], Abdul Qadeem Soomro[4], Abdul Haleem Mirani[5]

Department of Ophthalmology, [1,3,4,5]Isra Postgraduate Institute of Ophthalmology, Karachi
[2]Liaquat University of Medical & Health Sciences, Jamshoro

ABSTRACT

Purpose: To compare per-operative and early post-operative complications between Manual Small Incision cataract surgery and Phacoemulsification in patients with Senile Cataract.

Study Design: Quasi experimental study.

Place and Duration of Study: Al-Ibrahim Eye Hospital Karachi from December 2018 to October 2019.

Methods: Two hundred and seventy patients with senile Cataract were recruited for this study by convenient sampling technique. They were divided equally into two groups. Group I underwent Manual Small Incision Cataract Surgery (MSICS), whereas Group II underwent Phacoemulsification. Per-operative and early post-operative complications were recorded on day 1 in both groups. Data was analyzed using SPSS 24.0. Independent t-test was carried out with P-value of ≤0.05 was considered statistically significant.

Results: Mean age group – I was 54.95 ± 11.0 and in Group – II was 57.09 ± 10.59 (p = 0.546). There were 72 (53.3%) males in group – I and 74 (54.8%) in group – II with a non-significant difference (p-value > 0.01). There was significant difference for posterior capsule rupture and striate keratitis between the two groups (p = 0.031 and 0.044 respectively). Rest of the study parameters was not statistically different in the both group. None of the groups had a nucleus drop and vitreous prolapse. No significant difference was seen between the two groups concerning iris trauma (p = 0.56), wound leakage (p = 0.15) and hyphema (p = 0.32).

Conclusion: There is no significant difference between per-operative and early post-operative complications between MSICS and Phacoemulsification in patients with senile cataract except posterior capsular rupture and striate keratopathy which were more common in phacoemulsification group.

Key Words: Cataract, Senile Cataract, Phacoemulsification, Small Incision Cataract Surgery.

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Correspondence: Israr Ahmad Bhutto
Isra Postgraduate Institute of Ophthalmology
Karachi
Email: drisrarbhutto@gmail.com

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INTRODUCTION

Cataract is classified into congenital and acquired and it can affect one eye or both eyes.[1] It is the leading cause of blindness worldwide.[2] According to the World Health Organization (WHO), cataract is responsible for 47.8% of blindness and accounts for 17.7 million blind people.[3] It is associated with various modifiable risk factors. These risk factors include UV-light exposure, hypertension, diabetes, body mass

index (BMI), drugs, nutrition, smoking and socioeconomic status.[4,5] However, the advancement of age, a non-modifiable risk factor, is the single most important reason for Cataract.[6] This progression of age is what leads to Senile Cataract. Senile Cataract develops in the absence of any form of physical, chemical, or radiation trauma. In Pakistan, 570,000 adults are said to be blind (< 3/60) due to Cataract, with 3,560,000 eyes having a visual acuity of < 6/60 due to Cataract.[7,8] With the global burden of Cataract being enormous and age-related Cataract being the leading causes of visual impairment worldwide. Cataract surgery is the most commonly performed operation of the eye. It is estimated that 19.5 million procedures of Cataract were performed in 2011.[9] The two most commonly used surgical techniques to treat cataract are Manual Small Incision Cataract Surgery (MSICS) and Phacoemulsification.

As these surgical methods are widely performed, complication rates associated with these procedures must also be considered. Studies have shown that Phacoemulsification and MSICS yield low complications if performed with experienced hands.[10,11] Rationale of this study was to find out complications in MSICS and Phacoemulsification in patients with Senile Cataract in our setup.

METHODS

This experimental interventional study was carried out at the Isra Postgraduate Institute of Ophthalmology Al-Ibrahim Eye Hospital Karachi, from December 2018 to October 2019. The study was approved by the ethical review board. A total of 270 patients diagnosed with senile Cataract were selected for this study by convenient sampling and divided into two groups. Group I included patients that underwent Manual Small Incision Cataract Surgery and group II comprised of patients who underwent Phacoemulsification. Patient with other types of cataract including congenital and secondary cataract were excluded. Per-operative and post-operative complications were assessed in both groups. These included; rupture of posterior capsule, nucleus drop, vitreous prolapse, trauma to the iris, striate keratitis, wound leakage and hyphema. Data were analyzed using the Statistical Package of Social Science Version 24.0, with an independent t-test applied to compare the two groups. P-value ≤ 0.05 was considered statistically significant.

RESULTS

Mean age in group I was 54.95 ± 11.0 and in group II was 57.09 ± 10.59. There was no significant difference between the two groups (p = 0.546). It was observed that 72 (53.3%) patients were male in group I and 74 (54.8%) in group II, with a non-significant difference (p-value > 0.01, Table 1). There was significant difference for posterior capsule rupture and striate keratitis between the two groups (p-value < 0.05). For rest of the study parameters, there was no statistically significant difference between the two groups (Table 2).

Table 1: *Showing Frequency and Percentage of Gender Based Distribution of Patients.*

Variable	Group – I		Group – II		P-Value
	n	%	n	%	
Male	72	53.3	74	54.8	0.807
Female	63	46.7	61	45.2	

Table 2: *Showing the Frequency and Percentage of Post-operative Complication.*

Post-operative Complications			
	Group – I	Group – II	P value
Posterior Capsule Rupture	2 (1.5%)	4 (3.0%)	0.031
Nucleus Drop	0 (0%)	0 (0%)	------
Vitreous Prolapse	0 (0%)	0 (0%)	------
Trauma of Iris	1 (0.7%)	2 (1.5%)	0.562
Striate Keratitis	4 (3.0%)	6 (4.5%)	0.044
Wound Leakage	1 (0.7%)	0 (0%)	0.156
Hyphema On Day 1	1 (0.7%)	0 (0%)	0.316

Chi-square test was applied

DISCUSSION

Our study aimed to see if there are significant complications related with particular type of surgical treatment of Cataract. The study focused on MSICS and Phacoemulsification as these two methods are the most frequently employed when it comes to cataract surgery; however, future studies can be done on other surgical techniques as well. Only 2 (1.5%) patients out of 135 in the MSICS group developed posterior-capsule rupture while none of them had a nucleus drop and vitreous prolapse. In a study by Ruit et al., it was reported that MSICS and Phacoemulsification showed equal level of visual acuity and lower complication rates.[12]Venkatesh et al., in his study, also showed that

both surgical techniques delivered excellent visual outcomes and very low complications in rates, with only three eyes having posterior capsule rupture in the phacoemulsification group and only two eyes having rupture in the MSICS group.[13] These findings were in line with our study. Gogate et al. showed that both surgical techniques were safe to perform and were highly effective for visual rehabilitation.[14] Similar results were evident in our study, showing both Phacoemulsification and MSICS as being equally secure procedures. Bhargava et al., in his study, concluded that there was no significant difference in the complication rates of both MSICS and Phacoemulsification. However, MSICS was a much faster and preferred technique due to its easy accessibility in places such as eye camps.[15]

MSICS has proven to be a much cheaper option as compared to Phacoemulsification as it requires lesser equipment and proves to have lower complication rates and excellent visual outcomes. Although MSICS is a cheaper option, better results concerning visual acuity are observed in Phacoemulsification surgery. Although these surgical procedures are safe, and our study showed that there are no significant post-operative complications, the tendency of post-operative complications is still persistent. Posterior capsule rupture, recurrent uveitis, and cystoid macular edema all could occur in patients undergoing phacoemulsification surgery. Nonetheless, both procedures have low complications rates. Cook et al. conducted a study on 100 patients on which MSICS and Phacoemulsification were carried out and showed there was no difference in operative complications.[19] Therefore, both procedures can be carried out safely without the fear of developing complications as the complication rate in both techniques is very low. MSICS is the preferred technique, especially in the developing world, as it is much cheaper than Phacoemulsification, and more people can, therefore seek treatment for their Cataract.[20]

Limitations of this study are small sample size, single centered study and limited follow up of the patients.

CONCLUSION

Our study concluded that both MSICS and Phacoemulsification have low complication rates in patients with Senile Cataract. There is no significant difference between per-operative and early post-operative complications between MSICS and Phacoemulsification in patients with senile cataract except posterior capsular rupture and striate keratopathy, which are more common in phacoemulsification group.

Ethical Approval

The study was approved by the Institutional review board/Ethical review board (**A-00079).**

Conflict of Interest

Authors declared no conflict of interest.

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Authors' Designation and Contribution

Israr Ahmad Bhutto; Associate Professor: Concepts, *Design, Literature Search, Data Acquisition, Data Analysis, Statistical Analysis, Manuscript Preparation, Manuscript Editing, Manuscript Review.*

Maria Nazish Memon; Associate Professor: *Literature Search, Data Acquisition, Data Analysis, Statistical Analysis, Manuscript Preparation, Manuscript Editing, Manuscript Review.*

Irshad Ali; Consultant Ophthalmologist: *Literature Search, Data Acquisition, Data Analysis, Statistical Analysis, Manuscript Preparation, Manuscript Editing, Manuscript Review.*

Abdul Qadeem Soomro; Associate Professor: *Literature Search, Data Acquisition, Data Analysis, Statistical Analysis, Manuscript Preparation, Manuscript Editing, Manuscript Review.*

Abdul Haleem Mirani; Consultant Ophthalmologist: *Literature Search, Data Acquisition, Data Analysis, Statistical Analysis, Manuscript Preparation, Manuscript Editing, Manuscript Review.*