

Research

CHARACTERISTICS AND CLINICAL FEATURES OF PHACOEMULSIFICATION CATARACT SURGERY PATIENTS IN PASURUAN EYE HOSPITAL IN 2023

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ABSTRACT

Background: Cataract is a disease that has become the most common cause of visual impairment in Indonesia. Its incidence in Indonesia is about 210.000 cases/year, while cataract surgery rate is only 80.000 patients/year. One of provinces in Indonesia that has the highest cataract prevalence based on survey results that has been done by Rapid Assessment of Avoidable Blindness (RAAB) in 2014-2016 is East Java. There were 371.599 blindness cases with 81.1% from all the blindness cases caused by cataract.

Objective: This study described characteristics and clinical features of phacoemulsification cataract surgery patients in Pasuruan Eye Hospital in 2023.

Method: This quantitative research was done by using descriptive observational design and cross-sectional approach. Variable research was taken from medical records in Pasuruan Eye Hospital.

Results: There were 55 cataract surgery patients who completed all appointments with an ophthalmologist until D+30 of the surgery. Research results showed that 48 patients (87.2%) obtained good vision after undergoing cataract surgery using the phacoemulsification method. Proportion of cataract events was greater in women (54.5%) than men (45.5%). The most frequent surgical complication after phacoemulsification was corneal edema (23.6%).

Conclusion Most cataract surgery results using the phacoemulsification method show good visual acuity. However, there were cataracts that occur at ages less than 50 years. This condition requires action from health services to investigate the factors that influence the occurrence of cataracts at an earlier age.

Keyword: cataract, clinical features, phacoemulsification, pasuruan

INTRODUCTION

Cataract is a disease that has become the most common cause of visual impairment in Indonesia. Rapid Assessment of Avoidable Blindness (RAAB) survey in 2014-2016 declared that prevalence of blindness in Indonesia was about 3.0 % from all age groups.^[1] The most common cause of this blindness is cataracts that do not undergo surgery. Indonesian Ministry of Health stated that the prevalence rate of cataracts was around 80% of all blindness cases. From several provinces in Indonesia, East Java has the highest prevalence of blindness (371,599 cases).^[2]

A descriptive study that was conducted in East Java showed that the number of cataract cases in this province was increasing every year. The largest number increase in cataract cases occurred in 2021-2022 period. There were more than 17,000 new cases compared to the number of cataract cases in previous year.^[3] The incidence of cataracts in Indonesia is around 210.000 cases per year, while

cataract surgery rate has only reached around 80,000 patients per year. This data shows that the findings of cataract cases cannot be matched by the treatment currently available for cataract cases in Indonesia.^[4]

Currently, definitive treatment for cataracts is surgery. Cataract surgery is a cost-effective procedure and has been proven to significantly improve patient's quality of life.^[5] Until now, various surgical methods can be used to treat cataract cases. There are intracapsular cataract extraction (ICCE), extracapsular cataract extraction (ECCE), small incision cataract surgery (SICS), phacoemulsification, and femtosecond laser assisted cataract surgery (FLACS). As time goes by, cataract surgery become more efficient, providing increasingly significant visual acuity, and causing fewer complications.^[6] A meta-analysis study in 2022 stated that phacoemulsification showed more significant postoperative visual improvement with a lower surgical complication rate when compared with ECCE.^[7] On the other hand, systematic review done in United States showed that visual acuity or refractive outcomes of FLACS

was statistically equivalent to phacoemulsification cataract surgery.^[8] This shows that cataract surgery using the phacoemulsification method has good clinical outcomes.

Phacoemulsification method tends to provide good clinical outcome worldwide. Research done in United States shows that 2/3 from all surgery inspected showed good visual acuity outcome. Average visual acuity achieves 20/40, even in some patient that had history of diabetic mellitus.^[9] Other research in Indonesia stated that 95.8% of patients who had undergone cataract surgery using phacoemulsification method showed good visual acuity after 28 days of follow-up.^[10] Another similar study also showed visual improvement to good category visual acuity after 4th week from cataract surgery using phacoemulsification technique.^[11] However, similar study has never been done in East Java.

There are only a few studies on clinical features of post-cataract surgery patients using phacoemulsification method. In addition, similar research has never been carried out in East Java, while this province has the highest prevalence of cataracts in Indonesia. Based on these conditions, the author conducted research with the title "Characteristics and Clinical Features of Phacoemulsification Method Cataract Surgery Patients at Pasuruan Eye Hospital in 2023". The aim of this study is to describe characteristics and clinical features of phacoemulsification cataract surgery patients in Pasuruan Eye Hospital in 2023.

METHODS

The type of this study is quantitative research with descriptive observational research design and cross-sectional approach. Variables for this research were taken at one time using patient medical record data at the Pasuruan Eye Hospital. Research was performed at the Pasuruan Eye Hospital located on Jl. Raya Ngopak No. 56, Kerawan, Kedawung Wetan, Grati District, Pasuruan, East Java.

Research samples used in this study were Pasuruan Eye Hospital patients' medical records that had undergone cataract surgery in 2023. Data used in this research taken from patients who underwent phacoemulsification method, with or without intraocular lens implant, and were done by a single operator. Meanwhile, patients who did not complete post-cataract surgery follow up by the 30th day, patients with incomplete, or illegible medical record data would be excluded. All data then processed using Microsoft Excel and SPSS 27.0.1. Research was done independently without any financial disclosure or financial support by other party including the hospital.

RESULTS

In this research, there were 75 patients that went through cataract surgery using phacoemulsification technique at Pasuruan Eye Hospital in 2023. From the total population, there were 55 subjects who met the inclusion criteria and exclusion criteria. The data source was obtained from secondary data, which was done by looking at some

variables including sex, age, pre-operative visual acuity, post-operative visual acuity, and surgical complications.

Table 1 below shows the characteristics of cataract incidence at Pasuruan Eye Hospital in 2023. Table 2 and 3 below show the clinical characteristics of cataract cases based on visual acuity and complications obtained during the 2023 period.

Table 1. Description of cataract incidence at Pasuruan Eye Hospital in 2023.

Characteristics	N (%)
Age (years)	
18-45	3 (5.5%)
45-55	13 (23.6%)
55-65	23 (41.8%)
>65	16 (29.1%)
Sex	
Male	25 (45.5%)
Female	30 (54.5%)
Cataract stage	
Incipient	0 (0%)
Immature	33 (60%)
Mature	21 (38.2%)
Hyperature	1 (1.8%)

Table 2. Visual Acuity of Cataract Surgery Patients at Pasuruan Eye Hospital in 2023.

	Pre-Surgery	Post-Surgery		
		D+1	D+7	D+30
Good (6/6 – 6/18)	8	36	47	48
Moderate (6/18 – 6/60)	19	8	4	6
Severe (<6/60)	28	11	4	1

Table 3. Complications for Cataract Surgery Patients at Pasuruan Eye Hospital in 2023.

	Post-Surgery		
	D+1	D+7	D+30
No complication	33	51	55
Corneal edema	13	0	0
Uveitis	4	2	0
Descemet fold	9	0	0
Hyperemic conjunctiva	3	1	0
Subconjunctival bleeding	2	0	0
Iritis	0	1	0

DISCUSSION

Clinical Features of Cataract Surgery Patients Based on Age

From the research that had been conducted, cataract cases were most found in the 55-65 years age group (41.8%). These results are in line with research conducted in Jakarta, Indonesia in 2022. In this study, most cataract cases were found in the age group over 50 years (91.2%). As people age, the size of the lens will increase with the emergence of new lens fibers, causing cloudiness.^[12] Several other studies showed similar results, the majority of cataract sufferers were >50 years old. The aging process causes the

eye lens to degenerate, become hard and cloudy, and generally occurs over the age of 50 years old.^[13]

Clinical Features of Cataract Surgery Patients Based on Sex

Based on the study results, it was found that the number of cataract cases in women (54.5%) was slightly higher than in men (45.5%). Similar research results were obtained in research conducted in 2021 in Thailand. In this study, it was found that more cataract cases underwent phacoemulsification surgery in women (57.7%) than men.^[14] Another study states that these results can be influenced because in women who have entered menopause there will be a significant decrease in the amount of estrogen which will then cause greater cataracts in women than men. This estrogen hormone will then synthesize 17 β -estradiol which has benefits in protecting the lens from the process of cataract formation because of its mitogenic and anti-oxidative properties on lens epithelial cells, so that an imbalance of this estrogen hormone will reduce the protection of the lens from cataract formation.^[15]

Clinical Features of Cataract Surgery Patients Based on Visual Acuity

Based on the results obtained in this study, it is known that 48 subjects (87%) had good visual acuity results (6/6 – 6/18) after cataract surgery using the phacoemulsification method. In the other hand, 10% of the sample showed moderate vision (6/18 – 6/60), while the others (1.8%) showed visual acuity <6/60. Similar results were obtained in previous research. It was stated that the results of cataract surgery using the phacoemulsification technique mostly showed visual acuity >6/18 (44%), followed by moderate visual acuity (6/18 – 6/60) at 36%.^[16] Other study in Pakistan also provides almost the same results. About 92% non-diabetics and 85% diabetics patients achieved normal vision (\geq 6/12), 8% non-diabetics and 12.5% diabetics achieved moderate vision on first follow up post-operative day, and improving to normal vision within a week.^[17]

Clinical Features of Post-Cataract Surgery Patients Based on Complications

According to the table shown above, the most common complication during phacoemulsification surgery is corneal edema. However, corneal edema was found to only occur in post-operative D+1 in 13 cases (23%) and disappeared afterwards. The results obtained were almost similar to research conducted by Hanis in 2023.^[18] In the study, the complications of phacoemulsification that occurred were corneal edema (4.35%) and surgically induced astigmatism (4.35%).

A prospective study conducted in 2016 showed similar results. It is stated that complications from phacoemulsification surgery are divided into intraoperative and post-operative. The most common intraoperative complication was iris prolapse (2.6%), posterior capsule rupture (2.2%), and zonular dialysis (1.6%). Meanwhile, post-operative complications consisted of cystoid macular

edema (3.5%), increased IOP > 22 mmHg (2.1%), and corneal edema (1%).^[19]

There are some limitations in this research. This research does not include history of other diseases that can also influence outcome of the surgery. Besides that, the research only provides descriptive data. Authors believe the study results can be developed into analytics or more advanced study.

CONCLUSION

This study shows that clinical characteristics of cataract surgery patients in Pasuruan Eye Hospital were similar to cataract surgery patients in general. Almost all patients showed good visual acuity on examination on the 30th day after surgery. The most common surgical complication was corneal edema. However, corneal edema only occurred on the first day examination after cataract surgery using phacoemulsification technique. Although the results of the operation were found to be in accordance with various studies that had been carried out previously, there were incidences of cataracts outside the common age group. There were 16 cases of cataracts that happened under the age of 50 years. Therefore, health services need to evaluate the factors that may influence the occurrence of cataracts at an earlier age.

CONFLICT OF INTEREST AND FUNDING RESOURCES

Authors declared that there was no conflict of interest in writing this research. Authors also stated that the submission is original work and is not under review at any other publication.

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