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Meuthia Quin Latiefa GE
Utama Eye Clinic, Gresik, East Java, Indonesia

Uyik Unari Dwi K
Utama Eye Clinic, Gresik, East Java, Indonesia

Corresponding Author:
Meuthia Quin Latiefa GE
Utama Eye Clinic, Gresik, East Java, Indonesia

Pre-operative cataract patient profile at Utama eye clinic gresik period October-November 2023

Meuthia Quin Latiefa GE and Uyik Unari Dwi K

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Abstract
Background: Cataract is a decrease in lens quality due to lens crystallization. The definitive treatment for cataracts is surgery. Several factors, such as age, gender, family history, diabetes, and high blood pressure, influence cataract surgery. Cataracts are the most significant cause of blindness in people aged ≥ 50 years in the world. The cataract surgery rate in East Java is the lowest in Indonesia at 29.6%.
Objective: This study aims to determine preoperative data on cataract patients to help with surgical planning and complications during the operation.
Method: This research is a descriptive study with a cross-sectional approach at the Utama Eye Clinic in Gresik with research subjects, namely patients undergoing cataract examination and surgery in October - November 2023. The data used is secondary data through medical records. This research uses univariate analysis.
Results: A total of 185 preoperative cataract patients were collected in this study, with a distribution of 53.5% men and 46.5% women. Most (81 patients; 43.8%) were 60-69 years old. Patients with blindness were 82 eyes (44.32%). Most patients had blood sugar below 200 mg/dL; 164 (88.6%) and 151 (81.4%) had normal blood pressure. Power IOL use in patients ranged from 10 D to 26 D (mean: 20.75 D). The patient's variable IOP (Intra Ocular Pressure) was 7.6 mmHg - 22.90 mmHg (average: 14.53 mmHg). Operation time between 6 - 37 minutes (average: 13.54 minutes). The most extended operation was in 1 patient with a mature senile cataract accompanied by complications of iridodialysis and pseudoexfoliation syndrome.
Conclusion: A complete physical and supporting examination before cataract surgery helps the operator and team plan the surgical method used, anticipate the difficulties that will be faced, and understand the patient's condition to get the best surgical results.

Keywords: Cataract, pre-operation, surgery

Introduction

The sense of sight is the dominant sense that plays a vital role in daily life; without sight, we have difficulty seeing, walking, reading, working, and studying (WHO, 2023) [23]. A cataract is a decrease in the lens quality due to lens crystallization, which affects vision and can cause blindness. Cataracts are influenced by many risk factors, such as age, gender, family history, diabetes, and high blood pressure (AAO, 2021) [1]. Cataracts are the most significant cause of blindness in people aged ≥ 50 years in the world, with more than 15 million sufferers worldwide. Blindness caused by cataracts can be prevented (Bourne R, 2021) [4]. Based on the results of the 2014-2016 RAAB survey, Indonesia has 1.3 million people who are blind, and 1 million of them are caused by cataracts; East Java is declared as the contributor to the highest rate of blindness in Indonesia at 4.4% comes from age > 50 years, while for cataract cases the figure was 81.1%. The definitive treatment for cataracts is surgery; cataract surgery aims to optimize visual function (Astari, 2018) [2].

Several preoperative factors can influence cataract surgery, including age, retinal diseases, diabetes, uveitis, and preoperative visual acuity. For diabetic patients, factors such as hypoglycemic medications, hemoglobin A1C levels, and the presence of retinal diseases can impact surgical outcomes. In the case of uveitic cataract surgery, factors such as younger age, preoperative inflammatory corneal findings, and postoperative visual acuity can affect refractive outcomes. Additionally, preoperative pathological states such as uveitis and diabetes, as well as intraoperative techniques, can impact postoperative inflammation.

Furthermore, the incidence of postoperative endophthalmitis can be influenced by factors such as patient age, ethnicity, presence of ocular comorbidities, preoperative visual acuity, and the complexity of the cataract operation (Lara, 2014; Lee *et al*., 2023; Way, 2023) [10, 11, 22]. These factors highlight the importance of a comprehensive preoperative assessment and the need for tailored surgical approaches to optimize outcomes for patients with different risk profiles.

Only 29.6% of cataract sufferers receive cataract surgery in East Java, the lowest figure in Indonesia. The government and eye health stakeholders must firmly commit to increasing cataract surgery coverage by providing easily accessible cataract surgery services for people who need them (Wicitra *et al*., 2023) [24]. Preoperative data on cataract patients is beneficial to help operating operators plan their operations and think about the complications they will face during the operation. Therefore, researchers are interested in conducting research regarding the preoperative patient profile description of cataract surgery patients at the Gresik Utama Eye Clinic for October-November 2023.

Research Methods

This type of research is descriptive research with a cross-sectional approach. This research was conducted in October-November 2023. Data was taken from medical records of patients who underwent cataract surgery at the Gresik Utama Eye Clinic. The population of this study was cataract patients who underwent blood pressure, instantaneous blood sugar, best-corrected vision, intraocular pressure (IOP), and biometric examinations in October and November 2023 at the Utama Eye Clinic Gresik. The sample was a purposive sampling technique involving 185 respondents (185 eyes). The inclusion criteria for this study were patients who underwent cataract surgery. The exclusion criteria for this study were patients with incomplete medical records. This study used univariate analysis, including frequency distribution of research variables based on age, gender, blood pressure, instantaneous blood sugar, best-corrected vision, intraocular pressure, and IOL power. And operating time.

Results

Table 1 shows that of the 185 pre-cataract surgery patients at the Gresik Utama Eye Clinic from October to November 2023, 99 people (53.5%) were men, and 86 (46.5%) were women. This shows that the number of male cataract preoperative patients is more significant than that of females.

Table 1: Frequency Distribution of Pre-Cataract Surgery Patients Based on Gender at the Gresik Utama Eye Clinic for the Period October-November 2023

Gender	Number of people)	Percentage (%)
Man	99	53.5
Woman	86	46.5
Total	185	100

Table 2: Frequency Distribution of Pre-Cataract Surgery Patients Based on Age Group at the Gresik Utama Eye Clinic for the Period October-November 2023

Age (Years)	Number of people)	Percentage (%)
<40	3	1.6
40-49	15	8.1
50-59	52	28.1
60-69	81	43.8
70-79	29	15.7
>79	5	2.7
Total	185	100

Table 2 indicates that of the 185 respondents who underwent cataract surgery at the Gresik Utama Eye Clinic during October-November 2023, there were 81 patients (43.8%) aged 60-69 years and 52 (28.1%) aged 50-59 years. Years: 29 patients (15.7%) were aged 70-79 years, 15 patients were aged 40-49 years, and five patients (2.7%) were aged >79 years.

Table 3: Frequency distribution of pre-cataract surgery patients based on visual acuity groups at the Gresik Utama Eye Clinic for October-November 2023

Best Vision Correction	Amount (Points)	Percentage (%)
Mild visual impairment (<6/12)	2	1.08
Moderate visual impairment (<6/18)	60	32.43
Severe visual impairment (<6/60)	41	22.16
Blindness (<3/60)	82	44.32
Total	185	100

Based on Table 3, of the 185 respondents, it was found that pre-cataract surgery patients experienced the most blindness, 82 eyes (44.32%), followed by moderate damage, 60 eyes (32.43%), patients who underwent severe damage, 41 eyes (22.16%) and at least two eyes. (1.08%) patients had mild damage.

Table 4: Frequency Distribution of Pre-Cataract Surgery Patients Based on Blood Sugar Groups at the Gresik Utama Eye Clinic for the Period October-November 2023

When blood sugar	Number of people)	Percentage (%)
Normoglycemia (<200 mg/dL)	164	88.6
Hyperglycemia (≥200 mg/dL)	21	11.4
Total	185	100

Based on Table 4, for instant blood sugar distribution (GDS) data, the majority of patients had blood sugar below 200 mg/dL, 164 people (88.6%), while only 21 patients (11.4%) had blood sugar above 200 mg/dL. dL. This shows that most patients have reasonable control of blood sugar over time.

Table 5: Frequency Distribution of Pre-Cataract Surgery Patients Based on Blood Pressure Group at the Gresik Utama Eye Clinic for the Period October-November 2023

Blood pressure	Number of people)	Percentage (%)
Normotension (< 140/90 mmHg)	151	18.4
Hypertension (≥ 140/90 mmHg)	34	81.6
Total	185	100

From the data available in Table 5, it was found that the majority of patients had good blood pressure, 151 people (81.4%), while 34 people (18.4%) had blood pressure above average values.

Table 6: IOL power group, intra-ocular pressure, and operating time at the Utama Eye Clinic Gresik for the period of October-November 2023

Variable	N	Minimum	Maximum	Mean
Power IOL (Diopters)	185	10.00	26.00	20.75
IOP (mmHg)	185	7.6	22.90	14.53
Operating Time (Minutes)	185	6.00	37.00	13.54

IOL power variable shows a range of values from 10 D to 26 D, with an average of 20.75 D. The minimum value recorded for this variable is 10 D. In comparison, the maximum value is 26 D.

IOP (Intra-Ocular Pressure) variable distribution data shows values between 7.6 mmHg and 22.90 mmHg, with an average of 14.53 mmHg. The minimum value recorded was 7.6 mmHg, while the maximum was 22.90 mmHg.

Finally, the Operation Time variable (in minutes) shows a range of values between 6 and 37 minutes, with an average of 13.54 minutes. The fastest surgery was obtained in 3 patients with immature senile cataracts without complications, and the most extended operation was experienced by one patient with mature senile cataracts accompanied by complications of iridodialysis and pseudoexfoliation syndrome.

Discussion

In this study, it was found that the number of male patients was more significant than female. This is in line with the results of research by Natan PC *et al* 2023 [16]. in 2022 at the Mangusada Regional Hospital, Bali, namely 27 men (60%) and 18 women (40%), as well as research by Hanis *et al.* in 2022 at H. Abdul Manap Hospital Jambi, namely 109 men (56.48%) and 84 women (43.52%). However, different results were obtained in the Sa'at *et al.* 2022 [17] study, where patients who underwent cataract surgery using the phacoemulsification technique were dominated by 96,647 women (53.5%) and 84,129 men (46.5%). 8 of 15 studies in a systematic review by Fachir *et al.* 2023 [6] showed a significant relationship between gender and the choice of undergoing cataract surgery. Women undergo cataract surgery 0.76 times less often than men. Several social and economic factors and gaps in cultural norms, such as dependence on access to health facilities from others and fear of surgery, cause fewer women to undergo cataract surgery than men.

The 60-69-year age group dominated the age of the patients in this study. These results are in line with research by Ayu Dyah in 2021 at PKU Muhammadiyah Rogojampi Hospital, where the highest number of cataract patients was in the 60-69 year age group, namely 19 patients (46%) followed by the 70-79 year age group, namely eight patients (20%). Slightly different results were obtained in research by Gunawan GG *et al.* in 2019 [7] at Salamun Hospital; the most patients were in the 70-79 year age group, 13 people (38.2%), followed by patients in the 60-69 year and 50-59 year age groups: each year, as many as eight people (23.5%). As age progresses, the lens experiences cloudiness, thickening, and decreases in accommodation capacity. However, not only age factors but gender, race, genetics, smoking habits, exposure to ultraviolet light, economic status, education level, diabetes mellitus, hypertension, use of steroid drugs, and obesity are also risk factors for cataracts and the patient's choice to undergo surgery. (AAO, 2021) [1].

The most common visual impairment found in patients in this study was blindness and less severe visual impairment. The definition of blindness according to WHO is visual acuity less than 3/60 (Leng L *et al*. 2021) [12]. This is in line with research by Natasya *et al.* in 2022, where there were 196 eyes in the poor vision category (<6/60) and 17 eyes in the moderate vision category (<6/18-6/60). This is related to the length of time a patient receives health services, which indicates increasing health service coverage. Several socioeconomic factors that cause delays in cataract surgery in patients include.

- Inadequate costs.
- The burden of loss of daily income and delegation of household tasks.
- The distance to health services capable of performing cataract surgery.

Lack of patient awareness, especially patients who feel they do not need surgery because cataracts are only in one eye, and clinical decisions that do not yet indicate surgery, such as the presence of comorbidities and poor vision, are also factors preventing surgery (Vedachalam *et al*., 2022; Karenai FO *et al.* 2021; Chen *et al*., 2010) [25, 19, 5]. Delaying surgery for too long can worsen the cataract stage, where visual recovery is hampered, increasing the risk of postoperative complications and refractory disorders (Vasavada V *et al*., 2020) [20].

The blood sugar status of the patients in this study was dominated by normoglycemic patients (<200 mg/dL). Hyperglycemia conditions are associated with an increased risk of infection, risk of biometric and keratometry measurement errors due to changes in corneal topography, post-surgical inflammation, and a decrease in the ability of postoperative tissue regeneration. Therefore, the patient's glycemic status must be evaluated to determine the feasibility of surgery and the appropriate surgical method for optimal visual results. The phacoemulsification method is preferred in cataract patients with hyperglycemia because the incision area is narrow and the operation time is fast, thereby reducing retinal tissue damage (Mahadewi *et al*., 2022) [13].

The blood pressure of pre-cataract surgery patients must be evaluated to determine the patient's suitability for surgery. This study's patients with normotensive status (<140/90

mmHg) dominated. High blood pressure affects the suitability of anesthesia during surgery, for example, peribulbar anesthesia. It can delay surgery due to the need for blood pressure control (AAO, 2021) [1]. However, blood pressure does not significantly improve postoperative visual acuity (Sa'at N *et al*., 2022) [17]. Blood pressure can be caused by patient anxiety before a surgical procedure, so a counseling approach can be taken to help reduce blood pressure (Sari YK *et al*., 2018) [18].

The IOL power in this study had an average of 20.75 D. Biometry measures the length of the eyeball and the power of the cornea (keratometry). This data is needed to determine IOL power. Correct IOL power calculations are essential to obtain optimal refractive results, but this tool is only sometimes available, especially in developing countries (Vasavada V *et al*., 2020) [20]. Errors in measuring IOL power can cause postoperative refractive errors, so device limitations affect the quality of surgical results. IOL power calculations can use several formulas, and each formula works best at a particular axial length (AXL). Measurement of AXL, corneal curvature, and lens thickness using biometry dramatically influences the results of surgery (Natan PC, 2023) [16].

The normal IOP range is 10-21 mmHg (Hapsari RI, *et al*., 2013) [9]. In this study, the average IOP was found to be 14.53 mmHg. In patients with acute angle closure glaucoma, lens extraction can expand the *anterior chamber oculi* (COA) dimensions and angle width so that *aqueous humor flow* improves and IOP decreases. However, in patients with open-angle glaucoma, this procedure does not have much impact due to abnormalities in the trabecular tissue. When open-angle glaucoma has a severe degree, fluctuations or sudden increases in IOP can cause loss of visual acuity, so it is necessary to carry out more aggressive IOP control and delay the lens extraction procedure for at least six months or ideally two years after trabeculectomy with posterior cataract removal. (Melancia D, 2015) [15].

The average operating time was 13.54 minutes, with a reasonably wide time range of between 6 and 37 minutes. The operating time range is influenced by variations in complications in the patient undergoing the procedure; for example, a hardened lens requires higher ultrasonic energy and a longer time. However, the average operating time is relatively shorter. The claim that the Utama Gresik Eye Clinic provides cataract surgery services in 15 minutes is supported by reliable and experienced operating operators in their field. Cataract surgery lasts less than 20 minutes, most taking 6 to 15 minutes (Marafioti A *et al*., 2021) [14]. A study at Salamun Hospital in Bandung showed that the phacoemulsification operation time had an average of 27 minutes for mature cataracts and 26 minutes for immature cataracts, with a phaco time of under 3 minutes. Faster surgical procedures protect the corneal endothelium from damage due to exposure to high ultrasonic energy, reduce the risk of infection, and provide better visual acuity results (Gunawan GG *et al*., 2019) [7].

Conclusion

A complete physical and supporting examination before cataract surgery helps the ophthalmologist as the operator and the team to plan the surgical method used, anticipate the difficulties that will be faced, and understand the patient's condition to get the best surgical results.

References

1. American Academy of Ophthalmology. Cataract in the Adult Eye Preferred Practice Pattern; c2021.
2. Astari P. Cataracts: Classification, Management and Complications of Surgery. CDK-269; c2018, 45(10). Available from: https://media.neliti.com/media/publications/400259-katarak-bisnis-tatalaksana-dan-komp-7afb452d.pdf
3. Ayu Dyah A. Profile of Cataract Patients at the Eye Polyclinic of PKU Muhammadiyah Hospital Rogojampi. CoMPHI Journal: Community Medicine and Public Health of Indonesia Journal; c2022, 2(3).
4. Bourne R. Causes of Blindness and Vision Impairment in 2020 and Trends Over 30 Years, and Prevalence of Avoidable Blindness in Relation to VISION 2020: the Right to Sight: An Analysis for the Global Burden of Disease Study. Lancet Glob Health. 2021;9:e144-60. Available from: https://www.thelancet.com/action/showPdf?pii=S2214-109X%2820%2930489-7
5. Chen. Reasons for the Delay of Surgical Treatment among Patients with Age-Related Cataracts in Urban Chongqing, China. Sci Res Essays. 2010;5(20):3095-3099.
6. Fachir. Association between Gender and Utilization of Cataract Surgical Services: A Systematic Review and Meta-Analysis. Sriwijaya J Ophthalmol; c2023, 6(1).
7. Gunawan GG, Budiman MF, Djuarsa D. Overview of the Results of Mature and Immature Cataract Surgery Using the Phacoemulsification Method at Salamun Hospital; c2019-2021. Available from: https://karyailmiah.unisba.ac.id/index.php/dokter/article/view/26710
8. Hanis NFHA, Mayani G, Hanina. Overview of Visual Improvement and Intraoperative or Postoperative Complications in Senile Cataract Surgery Patients at H. Abdul Manap Hospital, Jambi City for the Period January 2021-December 2021. JOMS; c2022, 3(1). Available from: https://repository.unja.ac.id/43776/
9. Hapsari RI, Prahasta A, Enus S. Decreased intraocular pressure after cataract surgery in closed and open anterior chamber angle groups. MKB; c2013, 45(1). Available from: https://www.researchgate.net/publication/269555878_Penurunan_Tekanan_Intraocular_Pascabedah_Katarak_pada_Kelompok_Sudut_Bilik_Mata_Front_Closed_and_Open
10. Lara-Smalling A, Cakiner-Egilmez T. Diabetes and cataract surgery: preoperative risk factors and positive nursing interventions. Insight (Am Soc Ophthalmic Regist Nurs). 2014;39(2):18-20.
11. Lee DJ, Seto S, Banghart M, Boyd K, Thuruthumaly C, Suhler EB, *et al*. Risk Factors Associated With Unexpected Refractive Outcomes In Uveitic Cataract Surgery. Ocul Immunol Inflamm; c2023. p. 1-6.
12. Leng L. The Impact of Cataract Progression on Accuracy of Intraocular Lens Power Measurement. PLoS ONE; c2021, 16(2). Available from: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0246816
13. Mahadewi NWE. Effect of Uncontrolled Glycemic on Cataract Surgery Outcome in Patients with Diabetic Retinopathy. Med Sci Digest. 2022;13(2):466-469.

14. Marafioti A. Cata Net: Predicting Remaining Cataract Surgery Duration; c2021. Available from: https://arxiv.org/pdf/2106.11048.pdf 2021.
15. Melancia D, Pinto LA, Neves CM. Cataract Surgery and Intraocular Pressure. Karger Ophthalmic Res. 2015;53:141-148.
16. Natan PC, Triharpini NN, Sucicahyati D. Accuracy of Immersion Biometry in Cataract Surgery at the Eye Polyclinic RSD Mangusada Badung in 2022. J Medika Udayana; c2023, 12(6).
17. Sa'at. Factors Influencing Visual Improvement after Phacoemulsification Surgery among Malaysian Cataract Patients. Int. J Environ Res Public Health; c2022. Available from: https://doi.org/10/3390/ijerph191811485
18. Sari YK, Widayati A, Prayogi B. The Effect of Counseling with the Thinking, Feeling and Acting (TFA) Approach on the Blood Pressure of Pre-Cataract Surgery Patients. J Nurs Midwifery; c2018, 5(2).
19. Cause FO. Factors Associated With Delayed Uptake of Cataract Surgery Among Adult Patients at Mulago National Referral Hospital, Uganda. Afr Health Sci, 2021, 21(3).
20. Vasavada. Principles of Clinical Guidance for Cataract Surgery. APACRS. Asia-Pacific Association of Cataract & Refractive Surgeons; c2020.
21. Dachalam V. Reasons of Delay in Cataract Surgery in Patients with Advanced Cataracts during the COVID-19 Pandemic. Indian J Ophthalmol. 2022;70:2153-7.
22. Way C, Swampillai AJ, Lim KS, Nanavaty MA. Factors influencing aqueous flare after cataract surgery and its evaluation with laser flare photometry. Ther Adv Ophthalmol; c2023. p. 15. 25158414231204111.
23. WHO. Blindness and Visual Impairment; c2023. Available from: https://www.who.int/news-room/fact-sheets/detail/blindness-and-visual-impairment
24. Wicitra RK, Zamzam M, Cahyani F. Descriptive Study of Cataract and Refraction Cases in East Java Province in 2022. JENGGALA: J Health Serv Dev Res; c2023, 2(1).
25. Vedachalam S, Baquerizo N, Dalai AK. Review on impacts of low sulfur regulations on marine fuels and compliance options. Fuel. 2022 Feb 15;310:122243.