

Original Research Article

Characteristics of cataract patients who underwent cataract surgery in H. L. Manambai Abdulkadir hospital Sumbawa

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ABSTRACT

Background: Cataract is a clouding of the natural intraocular crystalline lens that can cause decrease in vision and may lead to blindness. Worldwide, cataracts are number one cause of preventable blindness. Cataract surgery is the most effective intervention regardless of its etiology. The purpose of this study was to obtain characteristics of cataract patients who underwent cataract surgery in H. L. Manambai Abdulkadir hospital Sumbawa based on cataract types, sex, age, comorbidities, initial visual acuity, and surgery methods

Methods: A quantitative study at H. L. Manambai Abdulkadir hospital Sumbawa. Consecutive, non-random sampling technique was used to recruit participants. This study enrolled 317 cataract patients who underwent cataract surgery

Results: Of the 317 patients, 172 (54.26%) were men, 301 (94.95%) senile cataract, 141 (44.48%) bilateral case, 210 (66.25%) initial visual acuity <3/60, 43 (13.56%) with diabetes mellitus. Two hundred and seventy eight (88.54%) underwent phacoemulsification surgery, with 303 (95.58%) experienced visual acuity improvement.

Conclusions: Most of cataracts patients who underwent cataract surgery were men, most surgery were done by phacoemulsification method. Senile cataract and bilateral case are the most common case. Patients had visual acuity improvement after cataract surgery.

Keywords: Cataract, Sumbawa, Characteristic

INTRODUCTION

Cataract is a condition of loss of transparency due to clouding of the intraocular lens that can cause decreased vision and the most common reversible blindness worldwide.¹ Cataracts are usually found in elderly individuals, although cataracts can occur due to traumatic events or birth defects.² Age is a factor the main risk of developing cataracts in men and women. Accumulation of oxidative stress in the lens, refractive disorders, smoking, exposure to UV rays, chronic diseases such as hypertension and diabetes are also said to be risk factors for cataracts.³ Based on data from the WHO, out of 1 billion people, as many as 94 million cases of distance vision problems or blindness are caused by cataracts.⁴ Rapid Assessment of Avoidable Blindness (RAAB)

survey was conducted by the Indonesian Ophthalmologist Association (IOA) found that the highest prevalence of blindness in Indonesia was in Central Java (4.4%), followed by West Nusa Tenggara at 4.0%.⁵ The highest cause of blindness was untreated cataracts. Operative is the most effective therapy for cataracts.⁶ Therefore, researchers wanted to know the characteristics of cataract patients who underwent surgery in H. L. Manambai Abdulkadir hospital Sumbawa.

METHODS

This research was a quantitative-descriptive study with a cross-sectional design. The data used in this study is secondary data from the medical records of patients who underwent cataract surgery. The population of research

are all patients who underwent cataract surgery at H. L. Manambai Abdulkadir hospital, Sumbawa from April 2023 to September 2023. Samples were taken using a consecutive sampling technique, where all cases met the inclusion criteria included in the research. The inclusion criteria are all patient who underwent cataract surgery at H. L. Manambai Abdulkadir hospital, Sumbawa from April 2023 to September 2023 which has the complete data of medical record. Patients who are loss to follow up after surgery are excluded in this research. The variables studied in this study were cataract type, gender, age, comorbidities, initial visual acuity, type of surgery performed, and improvement in post-op visual acuity. The data were processed in univariate analysis. This research did not carry out any intervention on subject.

RESULTS

During April-September 2023, there were 317 patients underwent cataract surgery at the H. L. Manambai Abdulkadir Sumbawa hospital. In this study, we found that there were more male patients than female, namely 172 people (54.26%), 145 women (45.74%). For age, it is categorized into six categories, with the most patient presented with age of 60-69 years old with 142 cases (44.7%), followed by age 70-79 years old with 77 cases (24.3%), 46- 59 years as many as 69 cases (21.8%), ≥80 years as many as 13 cases (4.1%), ages 18-45 years as many as 13 cases (4.1%), and finally the age range 0-17 years as many as 3 cases (1%). Based on the type of cataract, senile cataract was found to be more common underwent surgery, about 301 cases (94.95%), followed by presenile cataract 13 cases (4.1%), congenital cataract 2 cases (0.65%), juvenile cataract 1 cases (0.3%). 4 cases of presenile cataract were caused by trauma. A total of 141 cases (44.48%) had cataracts in both eyes, 112 cases (35.33%) in the right eye and 76 cases (20.19%) in the left eye. Based on initial visual acuity, 210 cases (66.25%) had initial visual acuity UCVA <3/60, followed by 64 cases (20.1%) had UCVA <6/60 to ≥3/60, 35 cases (11.04%) with UCVA <6/18 to ≥ 6/60, and 8 cases (2.73%) had UCVA ≥6/18. There were 43 patients suffering from comorbid metabolic diseases such as diabetes mellitus type 2 (13.56%), 26 people (8.2%) suffering from hypertension, and 15 people (4.7%) suffering from other metabolic diseases. 278 cases (87.7%) underwent phacoemulsification, ECCE in 27 cases (8.5%), and SICS in 12 cases (4%). After cataract surgery, 303 patients (95.58%) experienced improvement in vision, 5 patients (0.16%) experienced worsening vision, and 9 patients (4.26%) experienced no change in vision after surgery.

Table 1: Cataract patient distribution based on gender.

Gender	Total	Percentage (%)
Male	172	54.26
Female	145	45.74
Total	317	100

Table 2: Cataract patient distribution based on the age.

Age (In years)	Total	Percentage (%)
0-17	3	1
18-45	13	4.1
46-59	69	21.8
60-69	142	44.7
70-79	77	24.3
≥80	13	4.1
Total	317	100

Table 3: Cataract patient distribution based on type of cataract.

Type of cataract	Total	Percentage (%)
Congenital	2	0.65
Juvenile	1	0.3
Presenile	13	4.1
Senile	301	94.95
Total	317	100

Table 4: Cataract patient distribution based on the case.

Case	Total	Percentage (%)
RLE	141	44.48
RE	112	35.33
LE	76	20.19
Total	317	100

Table 5: Cataract patient distribution based on initial visual acuity.

Initial visual acuity	Total	Percentage (%)
UCVA <3/60	210	66.25
UCVA 6/60 ≥ 3/60	64	20.1
UCVA <6/18 ≥6/60	35	11.04
UCVA ≥ 6/18	8	2.73
Total	317	100

Table 6: Cataract patient distribution based on underlying disease.

Underlying disease	Total	Percentage (%)
DM type 2	43	13.56
Hypertension	26	8.2
Other metabolic disease	15	4.7
Total	84	26.46

Table 7: Cataract patient distribution based on operative surgery.

Operative surgery	Total	Percentage (%)
ECCE	27	8.5
SICS	12	4
PE	278	87.7
Total	317	100

Table 8: Cataract patient distribution based on post-operative visual acuity.

Post-operative visual acuity	Total	Percentage (%)
Improvement	303	95.58
Worsening	5	0.16
No change of visual acuity	9	4.26
Total	317	100

DISCUSSION

The lens has a biconvex transparent structure, which helps to refract and focus light onto the retina. Cataract is a clouding of the intraocular lens that causes decreased vision and blindness. The following symptoms present are decreased vision or blurred vision without pain in the eyes, or redness, sensitivity to glare.⁷ Cataracts have complications such as glaucoma, endophthalmitis, uveitis.⁸

Worldwide cataract prevalence is dominated by women.³ Older age and lower socioeconomic status are associated with greater differences in cataract incidence by sex.⁹ There is also a decrease in estrogen hormone in women during menopause which increases the risk of cataracts. Estrogen also functions as a protective hormone against oxidative stress which is related to lens opacification.^{2,3} In this study, there were more men underwent cataract surgery with a ratio of 54.26% and 45.7% to women. This is consistent with a study conducted by Fang et al although 60% of cataract patients are women, men are 1.39 times more likely to undergo cataract surgery than women. Compared with men, women have less support from family and less control over finances, which may hinder their access to cataract surgery.⁹ In research conducted by Raman et al neither men nor women showed significant differences prevalence of cataracts.¹⁰

Based on age, in this study the highest prevalence of cataracts presented within age 60-69 years with 142 cases (44.7%) and the most common type was senile cataract. This is in line with research conducted at Wangaya hospital by Krishnawati et al which found that the highest prevalence of cataracts was at ages >65 years (41%), followed by the age range 56-65 years (34%) and 46-55 years (18%). The most common type is senile cataract.²

Classification of cataracts is determined based on the age of onset. Congenital cataracts or infantile cataracts present at birth. Congenital cataracts develop during intrauterine growth due to environmental and genetic factors. There are 25 loci and genes on different chromosomes that congenital cataracts.¹¹ Juvenile cataracts occur in the first decade of life. Presenile cataracts appear before the age of 45 years. Presenile cataracts may caused by hereditary, trauma, chromosomal, endocrine, metabolic or systemic abnormalities.^{11,12} Senile cataracts are cataracts that occur

as a result of the aging process. Factors that influence senile cataracts are oxidative stress processes which changes the structure and clouding of the lens.^{1,12} A total of 141 cases (44.48%) had cataracts in both eyes, 112 cases (35.33%) in the right eye and 76 cases (20.19%) in the left eye. Based on research conducted by Chellapa et al in senile cataracts, there were progressive protein denaturation occurs in both eyes.¹³ This is also consistent with the findings of this study, 141 cases experienced cataracts in both eyes. Unilateral cataracts in young individuals usually caused by trauma and with a known history of injury. Other causes such as congenital, metabolic and senile cataracts are generally bilateral.^{11,12}

Surgery is the is the most effective treatment for cataracts, involves removing the cloudy crystalline lens and replacing it with an intraocular lens (IOL).^{8,14} Based on the type of operative procedure, we found that phacoemulsification was the most frequently used surgical technique, namely 278 cases (87.7%), followed by ECCE with 27 cases (8.5%), and SICS with 12 cases (4%).

Extracapsular cataract extraction (ECCE) is a routine operation that requires sutures and a large incision. SICS (Small incision cataract surgery) is a variation of ECCE that uses small incisions or incisions in the sclera. Both incisions were made in the anterior chamber capsule.⁶ With the development of medical technology, phacoemulsification (PE) is now widely used and has become treatment of choice for cataracts in developed countries because of the short operating time, small incision and injury area, and fast postoperative recovery.¹⁵ However, despite the advances in phacoemulsification technology, the costs are higher than ECCE and SICS, and still limited in developing countries. Based on research conducted by Li et al the best corrected visual acuity (BCVA) in patients operated on with phacoemulsification technique was higher than the ECCE technique ($p < 0.00001$). The proportion of vitreous prolapse and capsular tear in phacoemulsification intraoperative complications was lower than ECCE surgery. There were no significant differences in other complications proportion, such as zonular dialysis and central corneal oedema. In terms of postoperative complications, it was found that the proportion of capsule opacification and cystoid macular oedema after phacoemulsification surgery was lower than ECCE surgery, and there was no significant difference in the proportion of other complications such as high astigmatism.^{6,15}

After cataract surgery, 303 patients (95.58%) experienced improvement in visual acuity, 5 patients (0.16%) experienced worsening visual acuity, and 9 patients (4.26%) experienced no change in visual acuity. This is consistent with research conducted by Yi-Yong et al that said the most common procedure was phacoemulsification (91.3%) and 97.6% of patients operated on with the phacoemulsification technique

achieved postoperative vision better than 6/18, while those undergoing ECCE had a higher risk of vision worse than 6/18.¹⁶

There were 43 patients (13.56%) suffering from comorbid metabolic diseases such as type 2 diabetes mellitus, 26 people (8.2%) suffering from hypertension, and 15 people 4.7% suffering from other metabolic diseases. Based on research conducted by Memon et al and Chiang et al the results of clinical research show that the development of cataracts occurs more often in the earlier age in diabetic patients compared to non-diabetic patients.¹⁷ In diabetes mellitus, hyperglycemia can cause glycooxidation which increases the production of free radicals in the lens. This causes protein oxidation, so that the amount of water-insoluble protein increases in the lens and reduces lens transparency. Patients with diabetes are also more susceptible to intra- and postoperative complications.^{10,17} In patients with hypertension, systemic inflammation can occur, impaired potassium ion transport in lens epithelial cells, increased nitrogen monoxide, changes in protein structure that trigger cataracts.¹⁸ Other metabolic disease conditions are associated with activation of sorbitol pathway which increases cataract formation.^{11,16} This is in line with research conducted on 2,794 Malays, stated that the prevalence of cataracts increased along with high blood glucose, systolic blood pressure (BP), and metabolic syndrome components.¹⁹

Limitation of this study, there is no grading of senile cataracts in medical records, therefore cataract classification cannot be carried out in more detail, treatment history data on previous medical records like steroid usage also incomplete. Condition such as high myopia and other ocular comorbidities that highly contribute to poor vision alongside with cataract were not assessed during data collection.

CONCLUSION

During April to September 2023, there were more men with senile cataract and bilateral case who underwent cataract surgery which mostly done by phacoemulsification method and most of the patients had visual acuity improvement after surgery. The incidence of cataract surgery in West Nusa Tenggara are increasing over time, therefore our findings are expected to help in collecting national statistical data and determining future healthcare policies concerning cataract surgery in West Nusa Tenggara, Indonesia. Further research is needed to determine the correlation between risk factors and characteristics of cataract patients.

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