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CHARACTERISTICS OF OPEN ANGLE GLAUCOMA PATIENTS AT THE EYE POLYCLINIC PROF DR IGNG NGOERAH GENERAL HOSPITAL DENPASAR 2022

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ABSTRACT

Introduction: Open-angle glaucoma is a chronic, progressive, and irreversible multictorial optic neuropathy with open angle of the anterior chamber, accompanied by visual field disturbances, with increased intraocular pressure as the main risk factor, caused by trabecular meshworks resistance. The incidence of open-angle glaucoma is 2.4 million people each year. This study aims to determine the characteristics of open-angle glaucoma patients at the eve polyclinic Prof Dr IGNG Ngoerah Hospital Denpasar in 2022. **Methods**: This research is a descriptive analytical research with retrospective analysis. The study was conducted by collecting data based on observations of the medical records of patients who visited the Eye Polyclinic at Prof Ngoerah General Hospital in the period of January 1, 2022 until December 31, 2022. A total of 38 people (64 eyes) who met the inclusion and exclusion criteria were analysed using SPSS windows version 26.0. **Results**: The majority of subjects aged > 60 years (63.2%), male (68.4%). POAG (76.6%), SOAG (23.4%), the most common etiology of SOAG was lens induce, advanced stage (40.6%), and all had chronic onset. The median of visual acuity (logMar) pre operation vs three months post operation 1.0 vs 0.7, IOP 23 mmH vs 16 mmH, the mean of anti glaucoma medication was 1.37 vs 0.6. **Conclusion**: In patients with open-angle glaucoma, there is a good response to all treatment modalities (medical, trabeculectomy, phacoemulsification-IOL, phacoemulsification-IOL-trabeculectomy, implant glaucoma).

Keywords : open angle glaucoma., characteristics., intraocular pressure.

INTRODUCTION

Open-angle glaucoma is a chronic, progressive, and irreversible multictorial optic neuropathy with open angle of the anterior chamber, accompanied by visual field disturbances, with increased intraocular pressure as the main risk factor, caused by trabecular meshworks resistance. The incidence of open-angle glaucoma is 2.4 million people each year.[1,2]

Elevated intraocular pressure (IOP) is one of the main risk factors for the development of glaucoma later in life. Intraocular pressure increased if higher than 21 mmHg. Blindness due to glaucoma is 4 times more common in black people than white people. The gold standard diagnostic procedure for determining angle closure is a gonioscopy examination which must always be performed on every glaucoma patient. Surgery for open-angle glaucoma is usually performed when medication therapy is inadequate, cannot be tolerated by the patient, is ineffective and inappropriate for use in some patients, and the glaucoma remains uncontrolled with progressive damage or has a high risk of becoming more severe. Besides, patients with secondary open angle glaucoma must also be treated according to the cause.[3,4]

This study aims to determine the characteristics of open-angle glaucoma patients at the eve polyclinic Prof Dr IGNG Ngoerah Hospital Denpasar in 2022.

METHODS

This research is a descriptive analytical research with retrospective analysis. The study was conducted by collecting data based on observations of the medical records of patients who visited the Eye Polyclinic at Prof Ngoerah General Hospital in the period of January 1, 2022 until December 31, 2022. Data in this study include gender, age, domicile, occupation, main complaint, type of glaucoma, laterality, onset, procedure, cup dic ratio (CDR), visual acuity, intraocular pressure, and number of anti-glaucoma medications before and after the procedure. Ethical approval was obtained from the Health Research Ethics Committee, Faculty of Medicine, Udayana University, No. 926/UN14.2.2.VII.14/LT/2023.

The inclusion criteria for this study were all open-angle glaucoma patients who came to the Eye Polyclinic at Prof Dr IGNG Ngoerah Hospital and underwent treatment during the period 1 January 2022 to 31 December 2022. The exclusion criteria for this study were patients with incomplete medical records, patients who did not come for control up to at least 3 months after the procedure.

A total of 38 people (64 eyes) who met the inclusion and exclusion criteria were analysed using SPSS windows version 26.0 Normality test was carried out with Kolmogorov Smirnov.

The relationship between visual acuity, intra-ocular pressure, and number of medications before and after surgery was analyzed using the Friedman test and Wilcoxon test with a p-value <0.05 considered statistically significant.

RESULTS

The majority of subjects aged > 60 years (63.2%), male (68.4%), POAG (76.6%), SOAG (23.4%), the most common etiology of SOAG was lens induce, advanced stage (40.6%), and all had chronic onset. The characteristics of the research subjects can be seen in Table 1. and characteristics of eyes experiencing glaucoma can be seen in Table 2.

Table 1. Characteristics of research subjects

Characteristic	Frequency (n=38)	Percentage (%)
Age		
<40 years old	2	5.2
40-60 years old	12	31.6
>60 years old	24	63.2
Gender		
Male	26	68.4
Female	12	31.6
Symptoms		
Blurry vision	36	94.7
Ocular pain	1	2.6
Asymptomatic	1	2.6
Lateralisation		
Bilateral	27	71.1
Unilateral	11	28.9

Table 2. Characteristics of glaucoma

Characteristic	Frequency (n=64)	Percentage (%)
Glaucoma type		
POAG	49	76.6
SOAG	15	23.4
Etiology SOAG		
Lens induces	10	66.7
NVG	4	26.7
Sturge-weber syndrome	1	6.6
Stadium		
Mild	12	18.8
Moderate	17	26.6
Advanced	26	40.6
Absolut	9	14
Onset		
Chronic	64	100
Acute	0	0
Management		
Medications	31	48.4
Trabeculectomy	13	20.3
Phacoemulsification	13	10.3
Phacoemulsification + trabeculectomy	5	7.9
Glaucoma implant	2	3.1
Initial visual acuity	1.0 (0.4-1.78)	
Initial intraocular pressure	21 (16-26.5)	
CDR	0.7 (0.6-0.87)	
Initial amount of antiglaucoma medications		
0	5	7.8
1	31	48.4
2	27	42.2
3	1	1.6

The results of the Kolmogorov-Smirnov normality test showed that the data was not normally distributed, so the Friedman test was carried out. The results of the analysis showed that there was a significant difference in the visual acuity of open angle glaucoma patients before and after surgery (p<0.001). Visual acuity improves after surgery. The results of the analysis showed that there was a significant difference in IOP in open angle glaucoma patients before and after surgery (p<0.001).

The median of visual acuity (logMar) pre operation vs three months post operation 1.0 vs 0.7. The results of the analysis showed that there was a significant difference in the number of medications for open angle glaucoma patients before and after surgery (p<0.001). The amount of medication decreased after surgery, the mean of anti glaucoma medication was 1.37 vs 0.6.

Table 3. Differences visual acuity (VA) in open angle glaucoma patients before and after surgery

Variables	Median (IQR)	P-value*
VA before surgery (logMAR)	1.0 (0.85-2.48)	<0.001
VA 7 days after surgery	0.7 (0.5-1.95)	
VA 1 month after surgery	0.7 (0.4-1.78)	
VA 3-6 month after surgery	0.7 (0.3-1.78)	

*Friedman Test

Table 4. Differences intraocular pressure (IOP) in open angle glaucoma patients before and after surgery

Variables	Median (IQR)	P-value*
IOP before surgery	23 (18.5-28,5)	<0.001
IOP 7 days after surgery	17 (11-22)	
IOP 1 month after surgery	17 (10-20.5)	
IOP 3-6 month after surgery	16 (10-19.5)	

*Friedman Test

Table 5. Differences amount of anti-glaucoma medication before and after surgery.

Variables	Mean	P-value*
Before surgery	1.37	<0.001
After surgery	0.6	

*Wilcoxon Test

DISCUSSION

The results of this study show that patients who experience open angle glaucoma are predominantly aged 60 years or more. Two meta-analysis studies stated that the prevalence of glaucoma increases with age.[5,6] The results of this study showed that more open angle glaucoma patients were male (68.4%). This result is similar to a meta-analysis study which showed men were at greater risk of experiencing primary open angle glaucoma than women with an RR of 1.28 although the mechanism is still unknown.[7-9]

A total of 71.1% of open angle glaucoma cases in this study occurred bilaterally. These results are supported by Kim et al who stated that glaucoma most often occurs bilaterally, but does not rule out the possibility of unilateral glaucoma cases occurring. In unilateral glaucoma, usually the contralateral eye will eventually develop glaucoma as the disease progresses. Glaucoma is usually more severe in the eye that is first diagnosed.[5,6,10]

The European Glaucoma Society (EGS) states that the initial management of glaucoma is to reduce intraocular pressure with pharmacological therapy. There are two primary mechanisms for lowering intraocular pressure. The first is to reduce aqueous humor production with beta blockers (timolol, betaxolol, carteolol, metipranolol) and carbonic anhydrase inhibitors (brinzolamide, dorzolamide). The second is to increase the outflow of aqueous humor through the trabecular and uveoscleral pathways using prostaglandin derivatives (latanoprost, travoprost), sympathomimetic medications, and cholinergic/ parasympathomimetic (pilocarpine) medications.[1,11] In general, prostaglandin analogs are the first line of medical therapy. Patients can use up to three glaucoma medications at once depending on the severity of the glaucoma.[12-14]

Surgery for glaucoma is usually performed when medication therapy is inadequate, cannot be tolerated by the patient, is ineffective and inappropriate for use in some patients,

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and the glaucoma remains uncontrolled with progressive damage or has a high risk of becoming more severe. One of the most frequently performed surgical procedures is trabeculectomy. Because cataracts often occur simultaneously in glaucoma patients, in these cases trabeculectomy can be combined with phacoemulsification.[15-17] When trabeculectomy fails, or the factors that triggered the initial failure cannot be modified, or if it is not technically possible to perform a repeat trabeculectomy, or the patient has neovascular glaucoma, then implantation of a tube shunt or so-called glaucoma drainage device (GDD). In the patients in this study, the majority underwent medical therapy, followed by trabeculectomy alone or phacoemulsification alone, then a combination of phacoemulsification and trabeculectomy, and only 2 patients underwent GDD.[18,19]

This study shows that there is a significant improvement in visual acuity and intraocular pressure after surgery. The amount of medication also decreased significantly after surgery. Improvements in visual acuity and IOP were also maintained at follow-up in the third to sixth months after surgery. This study states that IOP decreases after surgery. This is because trabeculectomy and GDD create filters that can drain aqueous humor out of the eye.[20-23] Because there has been a reduction in IOP after surgery, the amount of anti-glaucoma medication can also be reduced.[1]

CONCLUSION AND SUGGESTION

The majority of subjects aged > 60 years (63.2%), male (68.4%), POAG (76.6%), SOAG (23.4%), the most common etiology of SOAG was lens induce, advanced stage (40.6%), and all had chronic onset. The median of visual acuity (logMar) pre operation vs three months post operation 1.0 vs 0.7, IOP 23 mmH vs 16 mmH, the mean of anti glaucoma medication was 1.37 vs 0.6. In patients with open-angle glaucoma, there is a good response to all treatment modalities (medical, trabeculectomy, phacoemulsification, phacoemulsification -trabeculectomy, implant glaucoma).

It is suggest that further studies can be completed by using more variables such as visual field status, OCT RNFL, central corneal thickness, and gonioscopy.

FINANCIAL SUPPORT AND SPONSORSHIP

Nil.

CONFLICT OF INTEREST

There are no conflicts of interest.

ETHICAL ASPECT

Ethical approval was obtained from the Health Research Ethics Committee, Faculty of Medicine, Udayana University, No. 926/UN14.2.2.VII.14/LT/2023.

REFERENCES

1. American Academy of Ophthalmology (AAO) 2022-2023. Glaucoma, Basic and Clinical Science Course. Section 10. San Francisco: 2022. p. 1-7, 177.
2. Yulia dan Khalisa. Primary Open Angle Glaucoma. Jurnal Ilmiah Kedokteran Dan Kesehatan. 2023;2(3), 48-57. [cited 2023 May 18]. Available from: https://doi.org/10.55606/klinik.v2i3.1880
3. Angelo. Karakteristik Pasien Glaukoma Sekunder RSUP Prof Ngoerah Tahun 2018-2020. Indonesia: Universitas Udayana. 2023. [Penelitian Deskriptif].
4. Al-Manjoumi, Filimban, Bantan, Abualhamayel, & Youldash. Prevalence of Risk Factors Among Patients With Glaucoma in Jeddah, Saudi Arabia. Cureus. 2023;15(4). [cited 2023 May 18]. Available from: https://doi.org/10.7759/cureus.37689
5. Zhang, Wang, Li, Jiang. Prevalence Of Primary Open Angle Glaucoma In The Last 20 Years: A Meta-Analysis And Systematic Review. Sci Rep. 2021;11(1):13762. [cited 2023 May 18]. Available from: 10.1038/s41598-021-92971-w.
6. Gedde, Vinod, Wright, Muir, Lind, Chen, dkk. Primary open-angle glaucoma preferred practice pattern. Ophthalmology. 2021;128(1):P71–150.
7. Bourne, Steinmetz, Saylan, Mersha, Weldemariam, Wondmeneh, dkk. 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 Heal. 2021; 9(2): e144–60.
8. Khandekar, Chauhan, Yasir, Al-Zobidi, Judaibi, dan Edward. The Prevalence And Determinants Of Glaucoma Among 40 Years And Older Saudi Residents In The Riyadh Governorate (Except The Capital) - A Community Based Survey. Saudi journal of ophthalmology: official journal of the Saudi Ophthalmological Society. 2021; 33(4), 332–337. [cited 2024 March 28]. Available from: https://doi.org/10.1016/j.sjopt.2019.02.006.
9. Kreft, Doblhammer, Guthoff, dkk. Prevalence, incidence, and risk factors of primary open-angle glaucoma - a cohort study based on longitudinal data from a German public health insurance. BMC Public Health. 2019: 19, 851. [cited 2024 March 28]. Available from: https://doi.org/10.1186/s12889-019-6935-6.
10. Srivastava, Gupta, Fatima, Dubey, Srivastava. Secondary open-angle pigmentary glaucoma resulting from a single-piece hydrophobic intraocular lens in the sulcus. Oman J Ophthalmol. 2023; 16(1):126-132. [cited 2024 March 28]. Available from: 10.4103/ojo.ojo_391_20.
11. Tan, Sng, Jonas, Wong, Jansonius, Ang. Glaucoma in myopia: diagnostic dilemmas. Br J Ophthalmol. 2019; 103(10): 1347–1355. [cited 2024 March 28]. Available from: https://doi.org/10.1136/bjophthalmol-2018-313530
12. Umezurike, Akhimie, Udeala, Green. Primary Open Angle Glaucoma: The Pathophysiology, Mechanisms, Future Diagnostic And Therapeutic Directions. Ophthalmology Research: An International Journal. 2019; 10(3):1–7.

13. Wang, Jonas, Jonas. Optic Nerve Head Anatomy In Myopia And Glaucoma. Including Parapapillary Zones Alpha. Beta. Gamma And Delta: Histology and clinical features. Prog Retin Eye Res. 2020; 83(8): 100933.
14. Schuster, Erb, Hoffmann, Dietlein, Pfeiffer. The Diagnosis and Treatment of Glaucoma. Dtsch Arztebl Int. 2020; 117(13):225-234. [cited 2024 March 28]. Available from: 10.3238/arztebl.2020.0225.
15. Setiabudi. Tatalaksana Pada Pasien Uveitik Glaukoma dengan Sequential Laser Iridotomi. [Laporan Kasus]. 2021. Indonesia: Universitas Udayana.
16. Esfandiari, Shah, Torkian. Five-year clinical outcomes of combined phacoemulsification and trabectome surgery at a single glaucoma center. Graefes Arch Clin Exp Ophthalmol. 2021; 257(2):357–362. [cited 2024 March 28]. Available from: 10.1007/s00417-018-4146-y.
17. Chen, Lin, Kao. Changes In Glaucoma Medication Numbers After Cataract and Glaucoma Surgery: A Nationwide Population-Based Study. Med United States. 2019; 98(4):0–5.
18. Gandhi, and Bhartiya. A Practical Illustrated Guide Glaucoma Drainage Devices. 2019.
19. Junoy, Müskens, Jansonius. Influence of glaucoma surgery on visual function: a clinical cohort study and meta-analysis. Acta Ophthalmol. 2019; 97(2):193-199. [cited 2024 March 28]. Available from: 10.1111/aos.13920.
20. Li, Tang, Zhang, dkk. The Effects of Trabeculectomy on Pseudoexfoliation Glaucoma And Primary Open-Angle Glaucoma. J Ophthalmol. 2020; (2):1723691. [cited 2024 March 28]. Available from: 10.1155/2020/1723691.
21. Lope, Vaz, Henriques, dkk. Outcomes of trabeculectomy with and without mitomycin C in pseudoexfoliative glaucoma compared with mitomycin C in primary open angle glaucoma. Med Hypothesis Discov Innov Ophthalmol. 2019; 8(2):73–80. [cited 2024 March 28]. Available from: https://pubmed.ncbi.nlm.nih.gov/31263716.
22. Majstruk, Leray, Bouillot, Michée, Sultan, Baudouin, dkk. Long term effect of phacoemulsification on intraocular pressure in patients with medically controlled primary open-angle glaucoma. BMC Ophthalmol. 2019; 19(1):1–7.
23. Wibawa. Implantasi Glaucoma Drainage Device pada Ocular Trauma-Related Glaucoma. [Laporan Kasus]. 2021. Indonesia: Universitas Udayana.