Sriwijaya Journal of Ophthalmology
Journal Homepage: https://sriwijayaopthalmology.com/index.php/sjo

# Characteristics of Primary Glaucoma in Glaucoma Clinic of Dr. Mohammad Hoesin General Hospital, Palembang

**Prima Maya Sari[1], Rizka Yunanda[2*]**

[1]Department of Ophthalmology, Dr. Mohammad Hoesin General Hospital, Palembang, Indonesia

[2]Department of Ophthalmology, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

**ARTICLE INFO**

**Keywords:**
Primary glaucoma
PACG
POAG

***Corresponding author:**
Rizka Yunanda

**E-mail address:**
*dr.rizkayunanda@gmail.com*

All authors have reviewed and approved the final version of the manuscript.

*https://doi.org/10.37275/sjo.v5i1.75*

**A B S T R A C T**

**Introduction:** Glaucoma is the second leading cause of blindness for over 70 million people worldwide. Bilateral blindness occurs with an estimated 10%. In Indonesia, the prevalence of glaucoma is 0,46%. That means that 4 to 5 out of 1.000 people suffer from glaucoma. Considering glaucoma as the second cause of blindness after cataracts in the world and its irreversible nature, this study was conducted to determine the characteristics of patients with primary glaucoma in the Glaucoma Clinic, Dr. Mohammad Hoesin General Hospital in 2021 based on age, gender, diagnosis, and intraocular pressure. **Methods:** This research is a descriptive retrospective study using secondary data through the medical record of patients in the Glaucoma Clinic, Dr. Mohammad Hoesin General Hospital Palembang from January to December 2021. The sample of this study was 20 people, and there were 40 eyes diagnosed with primary glaucoma. **Results:** The number of Primary Glaucoma patients was more in female patients, namely 11 patients (55,0%) with age varies at ≤ 50 years of age (45,0%), namely 51-60 patients (35,0%) and aged ≥ 61 years as many as 4 patients (25%), with an age range from 40 years to 70 years. Most patients were POAG (85%), with the highest eye pressure was 38,8mmHg, and 43,4 mmHg in PACG. **Conclusion**: There were 20 cases of primary glaucoma at the Glaucoma Clinic of Dr. Mohammad Hoesin General Hospital Palembang in 2021 with 40 affected eyes. Most patients were female, with most age group <50 years, and the most common type of glaucoma was open-angle.

## 1. Introduction

Glaucoma is the second leading cause of blindness for over 70 million people worldwide. Bilateral blindness occurs with an estimated 10%. In Indonesia, the prevalence of glaucoma is 0,46%. That means that 4 to 5 out of 1.000 people suffer from glaucoma. Based on online hospital application information (SIRS online), the number of glaucoma visits has increased the incidence of glaucoma during the period 2015-2017. The prevalence of glaucoma will increase if it is influenced by several factors, such as age, gender, race, family history, history of comorbidities (diabetes mellitus and hypertension), and a history of the eye examination.[1]

Glaucoma is a progressive degeneration of eye nerve damage caused by blockage of the eye's fluid flow system (aqueous humor). Aqueous humor is a natural fluid that plays a role in protecting the shape of the eye, supplying nutrients, and sterilizing dirt in the eye. The pressure inside the eyeball will remain normal if the fluid in the eyeball is absorbed periodically to avoid accumulation. However, if there is a build-up of fluid, the pressure on the eyeball will increase and cause damage to the optic nerve fibers. The symptoms can include visual disturbances with reduced visual fields, pain in the eyes, to headaches.[2]

## 2. Methods

This is a descriptive retrospective study using secondary data from medical records of patients at the Glaucoma Clinic of Dr. Mohammad Hoesin General Hospital Palembang from January to December 2021. The target population in this study was all primary glaucoma patients (open-angle glaucoma and angle-closure glaucoma). The research subjects are new patients in the Glaucoma Clinic of Dr. Mohammad Hoesin General Hospital who have been diagnosed by an ophthalmologist with primary glaucoma, either open-angle glaucoma or angle-closure glaucoma. The sampling technique in this study is total sampling. Data analysis is presented in the form of frequency.

## 3. Results

**Characteristics of primary glaucoma patients**

During the period from January 2022 to December 2022, there 313 patients were diagnosed with primary glaucoma, and 20 patients were included in this study. The clinical characteristics of patients with primary glaucoma are gender, age, type of primary glaucoma, and intraocular pressure (IOP).

**Gender**

In this study, the number of Primary Glaucoma patients was more in female patients, namely 11 patients (55,0%) than male 9 patients (45,0%).

Table 1. Distribution of primary glaucoma patients by gender

| Gender | N | (%) |
|---|---|---|
| **Male** | 9 | 45 |
| **Female** | 11 | 55 |
| **Total** | 20 | 100 |

**Age**

Patients were categorized into three groups based on age, namely the age group ≤ 50 years, 51-60 years, and ≥ 61. Most Primary Glaucoma patients were found at ≤ 50 years of age (45,0%), namely 51-60 patients (35,0%) and aged ≥ 61 years as many as 4 patients (25%), with an age range from 40 years to 70 years.

Table 2. Distribution of primary glaucoma patients by age

| Age | N | (%) |
|---|---|---|
| ≤50 | 9 | 45 |
| 51-60 | 7 | 35 |
| ≥61 | 4 | 25 |
| Total | 20 | 100 |

**Type of primary glaucoma**

Based on table 3, the number of primary glaucoma patients who experienced POAG was 17 people (85%), while those who experienced PACG were 3 (15%).

Table 3. Distribution of Primary Glaucoma patients by type of glaucoma

| Type of Primary Glaucoma | N | (%) |
|---|---|---|
| POAG | 9 | 45 |
| PACG | 7 | 35 |
| Total | 20 | 100 |

**Intraocular pressure (IOP)**

From table 4, the mean intraocular pressure of POAG oculi dextra and oculi Sinistra is lower than PACG oculi dextra and oculi sinistra. In PACG patients, the highest mean pressure was found in the right eye at 43.4 mmHg, while in the left eye, it was 22.3 mmHg. The highest pressure on the right eye is 31.2 mmHg, while the left eye is 23.7 mmHg. The lowest pressure on the left eye is 20.7 mmHg, while the right eye is 28.5 mmHg. In patients with POAG, the highest mean pressure was found in the right eye, which was 24.4 mmHg, while in the left eye, it was 24.3 mmHg. The highest pressure on the left eye is 38.8 mmHg, while on the right eye, it is 36.9 mmHg. The lowest pressure on the right eye is 16.3 mmHg, while the left eye is 21.3 mmHg.

Table 4. Distribution of Intraocular pressure in patients with PACG and POAG

| TIO | PACG | | POAG | |
|---|---|---|---|---|
| | N=3 | | N=17 | |
| | OD | OS | OD | OS |
| Mean | 43,4 | 22,3 | 24,4 | 24,3 |
| Max | 31,2 | 23,7 | 36,9 | 38,8 |
| Min | 28,5 | 20,7 | 16,3 | 21,3 |

## 4. Discussion

Glaucoma is a disease with characteristics of optic neuropathy consistent with excavation (reverberation) and damage to nerves and connective tissue from the optic disc, with the final development of a characteristic picture of vision that does not function normally. Gender, eye anatomy abnormalities, refractive errors, race, family history, hypertension.[3] Based on the results of this study, most of the primary glaucoma patients came from the age group <50 years. This is also in accordance with a previous study in Palembang in 2011 which stated that the distribution of glaucoma patients came from the 40-65 age group, which was 64.2%.

Gender is associated with an increased risk of glaucoma is a controversial issue. This can be seen in the following studies, which have different results. Glaucoma patients at Dr. Mohammad Hoesin General Hospital Palembang in 2006 were dominated by women (51.22%), while glaucoma patients at the Eye Polyclinic, Indera Hospital, Bali, were dominated by men (70%).[4] The factors that cause women to get glaucoma are early menopause, late menarche, oophorectomy, increased parity, and the use of oral contraceptives. Based on the theory that estrogen has neuroprotective against retinal ganglion cells by preventing glaucoma. This is because estrogen increases the number of collagen fibers in the lamina cribrosa, so it can reduce compression on retinal ganglion cell axons. The increased collagen fibers can also increase the flexibility of the entire eye, which will lead to a decrease in intraocular pressure.[5]

Age is one of the risk factors for primary glaucoma, where at the age of 40 years and over, the drainage system cannot function properly, resulting in an increase in IOP.[6,7] Based on research in Brazil from 2004 to 2015, where the majority of primary glaucoma patients, especially POAG, were women, as many as 56.8%.[8] This is consistent with the results obtained in this study, where as many as 55% of primary glaucoma patients were women.

Primary glaucoma can be classified into two, namely POAG and PACG. Based on the results of this study, the majority of patients experienced POAG (85%). This is similar to a previous study in the period from June 2016-June to 2017 in Makassar City, which stated that out of 52 primary glaucoma patients, 67.3% had POAG.[9] Previous research in 2011 in Palembang also found that the majority of patients had POAG (50.9%), followed by PACG (28.3%), absolute glaucoma (18.9%), and congenital glaucoma (1.9%).[10] POAG is glaucoma in which the anterior chamber angle is open or appears normal, but there is an obstruction to aqueous outflow. Humor. Blockage

occurs slowly and results in an increase in IOP. The progression of POAG is slow and chronic, and asymptomatic, so the patient is usually not aware until there is a narrowing of the visual field and a sharp decrease in vision. At the same time, PACG is angle-closure glaucoma where the angle of the anterior chamber of the eye is narrow, which results in obstruction of fluid out of the eye.

Primary glaucoma is a glaucoma of uncertain etiology. However, the main risk factor for primary glaucoma is an increase in intraocular pressure (IOP). In general, normal intraocular pressure (IOP) ranges from 10 to less than 21 mmHg.[11] IOP may increase due to system disturbances or access to drainage. Research conducted at Dr. Pringadi General Hospital Medan showed that the mean intraocular pressure of the right eye was higher than the left eye, which was 25.43 mmHg, while the average intraocular pressure of the left eye was 24.87 mmHg.[12] In this study, based on the type of primary glaucoma, the mean intraocular pressure was obtained. In the right eye, open-angle glaucoma is 24,4 mmHg, the highest pressure is 36,9 mmHg, and the lowest pressure is 16.3 mmHg. The mean intraocular pressure in left eye open-angle glaucoma was 24,3 mmHg, the highest pressure was 38,8 mmHg, and the lowest pressure was 21,3 mmHg. The mean intraocular pressure in right eye angle-closure glaucoma was 43,4 mmHg, with the highest pressure being 31,2 mmHg and the lowest pressure being 28,5 mmHg. The mean intraocular pressure in left eye angle-closure glaucoma was 22,3 mmHg, the highest pressure was 23,7 mmHg, and the lowest pressure was 20.7 mmHg. The mean intraocular pressure in patients with a diagnosis of POAG is lower than the average intraocular pressure in patients with a diagnosis of PACG because the increase in intraocular pressure that occurs in POAG occurs slowly with pressure on the optic nerve, which is not painful, and vision decreases slowly.

## 5. Conclusion

There were 20 cases of primary glaucoma at the Glaucoma Clinic of Dr. Mohammad Hoesin General Hospital Palembang in 2021 with 40 affected eyes. The most patient was women, with most age group was <50 years, and the most common type of glaucoma was the open-angle.

## 6. References


1. Anggraini N. Glaucoma risk factors. Green Med J. 2022: 4 (1).
2. Schuster AK, Erb C, Hoffmann EM, Dietlein T, Pfeiffer N. The diagnosis and treatment of glaucoma. Deutsches Arzteblatt International. 2020; 117(13): 225-34.
3. American Academy of Ophthalmology. 2020-2021 Basic and Clinical Science Course: Glaucoma. New York: EDS Publications Ltd. 2020.
4. Fidalia. The prevalence and risk factors of open-angle primary glaucoma and its management in the Eye Section of the Faculty of Medicine, UNSRI / RSMH Palembang. Palembang: Fakultas Kedokteran Universitas Sriwijaya. 2006.
5. Krieglstein GK. Essentials in Ophthalmology: Glaucoma. United States: Spinger Publishing Company. 2008: 13-21.
6. Ou Y. Risk factors of primary open-angle glaucoma. Bright Focus Foundation. 2019.
7. Dietze J, Blair K, Havens SJ. Glaucoma. In: StatPearls. Treasure Island (FL): StatPearls Publishing. 2020.
8. Yokoyama Y. Characteristics of patients with primary open-angle glaucoma and normal-tension glaucoma at a university hospital: a cross-sectional retrospective study. BMC Res Notes. 2015: 8(1).
9. Jafar N. Characteristics of primary glaucoma sufferers at the Pendidikan Unhas Hospital, Makassar City for the period of June 2016 – June 2017. Digilib.Unhas.Ac.Id. 2017.
10. Dienda M, Ibrahim I, Ramdja M. Characteristics of glaucoma sufferers at the eye clinic of Muhammadiyah Palembang

Hospital in 2011. Syifa' MEDIKA: J Kedokteran Kesehatan. 2013; 4(1):36.
11. WHO. Improving eye care in Rwanda. 2020.
12. Mahrani H. Characteristics of Glaucoma Sufferers at Dr. Pirngadi Hospital Medan in 2007. Medan: USU Repository. 2007.