



Characteristics of Primary Open Angle Glaucoma Patients at Dr. Mohammad Hoesin General Hospital, Palembang, Indonesia

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ABSTRACT

Introduction: People in Indonesia do not know much about glaucoma, even though glaucoma causes many people to go blind. This is because most people with glaucoma don't realize anything is wrong because the damage occurs slowly. If glaucoma is not treated immediately, it can result in irreversible vision loss and can cause blindness. This study aimed to present the characteristics of primary open-angle glaucoma patients at Dr. Mohammad Hoesin General Hospital, Palembang, Indonesia. **Methods:** This study is a descriptive observational study. A total of 33 subjects participated in this study. Data analysis was carried out univariately with the help of SPSS. **Results:** The majority of research subjects were men, aged between 40-69 years, and had a history of high school education. The majority of study subjects had clinical forms of the mild cup-to-disc ratio with early degrees of visual field defects and intraocular pressure <21 mmHg with therapy. The majority of research subjects had no history of hypertension, no history of diabetes mellitus, and no family history of similar disorders. The majority of research subjects have refractive disorders. The majority of research subjects received medical therapy. **Conclusion:** Characteristics of primary open-angle glaucoma patients at Dr. Mohammad Hoesin General Hospital have a clinical form of mild CDR, have refractive disorders, and receive medical therapy to control increased intraocular pressure.

1. Introduction

Primary open-angle glaucoma or Primary Open Angle Glaucoma (POAG) is characterized by the angle of the anterior chamber being open or looking normal, but the fluid in the eyeball cannot come out because there is a blockage. This blockage occurs slowly and results in an increase in pressure in the eyeball. Glaucoma has reached an advanced stage in this phase, and nerve damage is progressive. Because of this, it is often called the "silent blinding disease" or "sneak thief of sight". The number of cases of primary

open-angle glaucoma in the adult population (40-80 years) is estimated to be 52.68 million in 2020 and 79.76 million in 2040. The prevalence of primary open-angle glaucoma based on population varies widely, for example, risk factors such as age, gender, and geographic location of the population. Africa (South Africa, Ghana, and Nigeria) was found to have the highest prevalence of primary open-angle glaucoma at 4.0% (2.6 ~ 6.1%), and Oceania (Australia) was found to have the lowest prevalence at 1.8%. In Indonesia, the prevalence of glaucoma is 0.46%, meaning that as

many as 4 to 5 people out of 1,000 Indonesians suffer from glaucoma.¹⁻⁵

People in Indonesia do not know much about glaucoma, even though glaucoma causes many people to go blind. This is because most people with glaucoma don't realize anything is wrong because the damage occurs slowly. If glaucoma is not treated immediately, it can result in irreversible vision loss and can cause blindness. There are several risk factors associated with the occurrence of this disease, including gender, age, race, family history, intraocular pressure (IOP), hypertension, and diabetes mellitus. Black races are known to have a 3-4 times greater risk of suffering from primary open-angle glaucoma than Caucasians. In addition, damage to the optic nerve head is six times more likely to occur in blacks than in caucasians.⁶⁻¹¹ This study aims to present the characteristics of primary open-angle glaucoma patients at Dr. Mohammad Hoesin General Hospital, Palembang, Indonesia.

2. Methods

This study was a descriptive observational study and used secondary data in the form of medical record data at Dr. Mohammad Hoesin General Hospital, Palembang, Indonesia. The sample of this study were primary open-angle glaucoma patients at the Ophthalmic Polyclinic of Dr. Mohammad Hoesin

General Hospital Palembang in 2019 who met the inclusion criteria, as many as 33 subjects. The inclusion criteria were patients with primary open-angle glaucoma at the Eye Polyclinic of Dr. Mohammad Hoesin General Hospital Palembang in 2019 with complete medical record data and have been declared to have primary open-angle glaucoma. This study was approved by the health and research ethics committee of the Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia.

Data was collected and recorded according to the variables needed for the study, namely age, gender, clinical symptoms, risk factors, and type of therapy. Then, the data were processed using SPSS statistics 24 software. Then, the data was presented in tabular form and explained in univariate narrative form.

3. Results

Table 1 shows the sociodemographic description of the research subjects. Table 1 shows that the majority of research subjects were men, aged between 40-69 years, and had a history of high school education. Table 2 shows the clinical picture of the study subjects. Table 2 shows that the majority of study subjects had clinical forms of the mild cup-to-disc ratio with early degrees of visual field defects and intraocular pressure <21 mmHg with therapy.

Table 1. Sociodemographic description of research subjects.

| Variable | Frequency | Percentage |
|--------------------|-----------|------------|
| Gender | | |
| Male | 17 | 51.5 |
| Female | 16 | 48.5 |
| Age | | |
| <40 Years | 4 | 12.1 |
| 40-69 Years | 28 | 84.8 |
| >70 Years | 1 | 3.0 |
| Education | | |
| Primary School | 5 | 15.2 |
| Junior High School | 8 | 24.2 |
| Senior High School | 14 | 42.4 |
| Masters | 6 | 18.2 |

Table 2. Clinical description of research subjects.

| Variable | Frequency | Percentage |
|------------------------------|------------------|-------------------|
| Cup to Disc Ratio | | |
| Light | 18 | 54.5 |
| Currently | 3 | 9.1 |
| Carry on | 11 | 33.3 |
| Hard to watch | 1 | 3.0 |
| Visual Field Defect | | |
| Early | 16 | 48.5 |
| Moderate | 4 | 12.1 |
| Advance | 13 | 39.4 |
| Intra Ocular Pressure | | |
| <21mmHg with Therapy | 16 | 48.5 |
| ≥ 21mmHG without Therapy | 10 | 30.3 |
| ≥ 21 mmHg on Therapy | 7 | 21.2 |

Table 3 shows an overview of the research subject's risk factors. The majority of research subjects had no history of hypertension, no history of diabetes mellitus, and no family history of similar disorders.

The majority of research subjects have refractive disorders. Table 4 shows the description of the research subject's therapy. The majority of research subjects received medical therapy.

Table 3. Description of the risk factors of research subjects.

| Variable | Frequency | Percentage |
|-------------------------------------|------------------|-------------------|
| History of Hypertension | | |
| Exist | 11 | 33.3 |
| There isn't any | 19 | 57.6 |
| No data | 3 | 9.1 |
| History of Diabetes Mellitus | | |
| Exist | 5 | 15.2 |
| There isn't any | 24 | 72.7 |
| No data | 4 | 12.1 |
| Family History | | |
| Exist | 1 | 3.0 |
| There isn't any | 28 | 84.8 |
| No data | 4 | 12.1 |
| Refractive Status | | |
| Ametropia | 24 | 72.7 |
| Emmetropia | 9 | 27.3 |

Table 4. Description of research subject therapy.

| Therapy | Frequency | Percentage |
|---------------------|------------------|-------------------|
| Medicamentosa | 23 | 69.7 |
| Combination therapy | 10 | 30.3 |
| Total | 33 | 100.0 |

4. Discussion

The results of this study were supported by previous research, which stated that primary glaucoma was found to be more common in men, namely as many as 26 people (61.9%), while women were 16 people (38.09%). Another study stated that men with primary open-angle glaucoma based on

gender were more experienced males, namely 34 people (60.7%), compared to females, namely 22 people (39.3%). Anatomical differences may be one of the reasons why men more often suffer from primary open-angle glaucoma, where men have a thinner retinal nerve fiber layer (RNFL) than women. Studies also show that estrogen in women has a

neuroprotective effect on the optic nerve. Another study states that the age group with the highest incidence of primary open-angle glaucoma (44.6%) is 50-59 years. Another study revealed that the average age of patients with primary open-angle glaucoma was 60-74 years, with the greatest percentage falling between the ages of 55 and 64 years. Age promotes tissue aging and prolonged exposure to glaucoma risk factors, as well as decreased aqueous humor outflow, leading to increased intraocular pressure. Age-related changes in elastin and type I collagen stiffness limit the flexibility of the lamina cribrosa, consequently reducing the strength of retinal ganglion cell axons in the presence of increased intraocular pressure. Thus, the optic nerve in old age is prone to loss of function due to glaucoma-related damage. Blindness in glaucoma sufferers is related to the behavior of immediately checking themselves when they feel the initial symptoms and the habit of carrying out periodic checks. This behavior is partly influenced by socioeconomic factors, which also affect access to information from various media. Socioeconomic factors can be described, among others, from the level of education. The highest prevalence of blindness was found in the group with low education, followed by the group with no educational data, and the lowest was in the higher education group.¹²⁻¹⁵

More patients with a mild cup-to-disc ratio (CDR) category are in line with the literature review, which says that primary open-angle glaucoma is a progressive disease, so this disease can occur slowly. The cup/disc ratio and visual field abnormalities are related, but there are situations where the cup/disc ratio is still within normal limits, but there is already a visual field defect. Glaucoma is a group of optic neuropathy characterized by irreversible, progressive degeneration of ganglion cells in the retina, which will cause cupping of the optic disc and cause vision loss. Considering that glaucoma is the second leading cause of blindness in the world after cataracts and is irreversible. The study found that the majority of CDR patients with primary glaucoma were in severe condition, namely ≥ 0.8 in the right eye (48.8%), and

the same between moderate and severe conditions in the left eye, namely 14 patients (34.1%) each. The increase in CDR is caused by an increase in IOP (intraocular pressure) which causes pressure on the head of the optic nerve so that the cup enlarges, and an increase in CDR automatically occurs.¹⁶⁻¹⁸

Giving timolol maleate is suggested to reduce the formation of aqueous humor fluid. Timolol is included in the category of non-selective beta-blockers with maximum activity and concentration in the posterior chamber of the eye, which is obtained 30 - 60 minutes after topical administration. As initial treatment, non-selective beta blockers can be given twice every 20 minutes and again 4, 8, and 12 hours later. Timolol is a non-selective beta blocker. Therefore it should be used with caution in patients with asthma, COPD, and heart disease. To prevent the prevalence of more serious disorders in patients, patient education should emphasize the need for patient discipline to continue taking medications that can reduce intraocular pressure.^{19,20}

5. Conclusion

Characteristics of primary open-angle glaucoma patients at Dr. Mohammad Hoesin General Hospital have a clinical form of mild CDR, have refractive disorders, and receive medical therapy to control increased intraocular pressure.

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