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Glaucoma Prevalence in Diabetes Mellitus Patients at the Eye Policlinic, Prof. Dr. H. Aloei Saboe Gorontalo

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ABSTRACT

Introduction: Glaucoma is a disease of damage to the optic nerve that causes narrowing of the visual field and loss of visual function. One of the systemic conditions that can trigger glaucoma is diabetes mellitus. This study aims to determine the prevalence of glaucoma in diabetic patients at the Eye Polyclinic of RSUD Prof. Dr H. Aloei Saboe Gorontalo.
Methods: This research used a descriptive retrospective study design on medical records at Eye Polyclinic of RSUD Prof. Dr H. Aloei Saboe Gorontalo from January to December 2020.
Results: The results showed that from 12 cases of glaucoma in diabetes mellitus patients, there were more males, namely 8 patients (66.7%) and 4 patients (33.3%). Based on the age group, the most in the 40-60 year age group were 10 patients (84%). Based on the type of diabetes, all cases were found in type II diabetes, namely 12 patients (100%). Based on the length of time the patient had diabetes, it was found that 11 patients (92%) had diabetes >5 years.
Conclusion: In patients with diabetes mellitus, the prevalence of glaucoma was more in men who had diabetes for a long time.

Keywords: Diabetes mellitus, glaucoma

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INTRODUCTION

Glaucoma is one of the leading causes of blindness globally and is the leading cause of permanent blindness. Glaucoma is a collection of symptoms with a characteristic optic neuropathy associated with visual field loss. According to WHO, 8% of all cases of blindness worldwide are caused by glaucoma.[1,2,3] Basic Health Research (Riskesdas) in 2007 reported that the prevalence of glaucoma in Indonesia was 0.46%, where 4 to 5 people out of 1000 population Indonesia has glaucoma. Based on online hospital application data (SIRS online), the number of visits to outpatient glaucoma patients at the hospital has increased. In 2017, there were 80,548 cases of glaucoma. Based on gender, more women than men.[4]

Glaucoma can be caused by systemic disease or local disease of the eye. One of the systemic disorders that can trigger glaucoma is diabetes mellitus (DM). In DM patients, there are increased tortuosity, focal dilatation and narrowing of blood vessels, the formation of microaneurysms and choriocapillaris blood vessel disorders in the form of decreased choroidal perfusion. It has reduced blood flow results in tissue ischemia and tissue death. Decreased choroidal perfusion can be found in normal pressure glaucoma associated with functional (field of view) and morphological (damage to the nerve fibre layer) disturbances.[1, 4-6]

Diabetes mellitus is a chronic disease in a metabolic disorder characterized by blood sugar levels that exceed normal limits. Diabetes mellitus was established when fasting blood levels more than 126 mg/dL, blood glucose 2 hours after loading more than 200 mg/dL, or blood glucose at 200 mg/dL accompanied by symptoms of frequent hunger, thirst and urination in large quantities and weight loss.

The results of Riskesdas 2018 revealed that the prevalence of DM in Indonesia based on a doctor's diagnosis at the age of 15 years is 2%. This data shows an increase compared to the prevalence of DM in the population 15 years at Riskesdas 2013 of 1.5%. However, according to the results of blood sugar examinations, the prevalence of DM increased from 6.9% in 2013 to 8.5% in 2018. This data suggests that only about 25% of DM sufferers know DM. Almost all provinces showed an increase in prevalence in 2013-2018, except for the province of East Nusa Tenggara. Gorontalo is included in the province category with the highest prevalence increase of 0.9%, along with Riau, Jakarta, Banten and West Papua.[4]

METHODS

This study used a retrospective descriptive method of patient medical record data at the Eye Polyclinic at Prof. Hospital. Dr H. Aloei Saboe Gorontalo from January to December 2020. The population of this study were patients with DM who had their eyes checked at the eye polyclinic at Prof. Hospital. Dr H. Aloei Saboe Gorontalo from January to December 2020. The research variables

were glaucoma sufferers, age, gender, and type of glaucoma.

RESULTS

From the data obtained from medical records at the Eye Polyclinic at RSUD Prof. Dr H. Aloei Saboe Gorontalo from January to December 2020, there were 12 cases of glaucoma. Based on Table 1, it was found that the distribution of glaucoma cases in patients with diabetes mellitus at the Eye Polyclinic at Prof. Hospital. Dr H. Aloei Saboe Gorontalo by gender, 8 male patients (66.7%) and 4 female patients (33.3%).

Table 1. Distribution of glaucoma cases by gender in patients with diabetes mellitus at the Eye Polyclinic at Prof. Hospital. Dr. H. Aloei Saboe Gorontalo

Gender	Total (n)	Proportion (%)
Male	8	66.7
Female	4	33.3
Total	12	100

Based on Table 2, it was found that the distribution of glaucoma cases in diabetes mellitus patients at the Eye Polyclinic at Prof. Hospital. Dr H. Aloei Saboe Gorontalo based on the most age group in the 40-60 year age group, as many as 10 patients (84%), followed by the age group <40 years with 1 patient (8%) and the age group over >60 with 1 patient (8%).

Table 2. Distribution of glaucoma cases in diabetes mellitus patients by age at the Eye Polyclinic at Prof. Hospital. Dr. H. Aloei Saboe Gorontalo

Age	Total (n)	Proportion (%)
<40 years	1	8
40-60 years	10	84
>60 years	1	8
Total	12	100

Based on table 3, it was found that the distribution of glaucoma cases all occurred in type II diabetes, namely 12 patients (100%) at the Eye Polyclinic at Prof. Hospital. Dr. H. Aloei Saboe Gorontalo. In addition, based on table 4, it was found that the distribution of glaucoma cases at the Eye Polyclinic at Prof. Hospital. Dr H. Aloei Saboe Gorontalo was aware that he had suffered from diabetes mellitus for > 5 years in 11 patients (92%) and suffered < 5 years in 1 patient (8%).

Table 3. Distribution of glaucoma cases by type of diabetes mellitus at the Eye Polyclinic at Prof. Hospital. Dr. H. Aloei Saboe Gorontalo.

Type of diabetes mellitus	Total (n)	Proportion (%)
Type I	0	0
Type II	12	100
Total	12	100

Table 4. Distribution of glaucoma cases in patients with diabetes mellitus based on length of suffering diabetes at the Eye Polyclinic at Prof. Hospital. Dr. H. Aloei Saboe Gorontalo.

Length of suffering DM	Total (n)	Proportion (%)
< 5 years	1	8
>5 years	11	92
Total	12	100

Discussion

Based on the recent results, there were 12 cases of glaucoma in patients with diabetes mellitus. Diabetes mellitus is a systemic disease that can be a risk factor for glaucoma. Patients with diabetes mellitus have three main complications, namely diabetic retinopathy, cataracts and glaucoma. Patients with diabetes mellitus are more at risk of developing glaucoma than individuals who do not have diabetes. Glaucoma is known as a cause of irreversible blindness if it is not treated promptly and appropriately; therefore, the detection of glaucoma cases is very important so that glaucoma sufferers are identified and treated before blindness occurs.

In this study, 12 cases of glaucoma were found in diabetic patients. The number of affected men was more than women. In a study conducted in RSUP Dr.M. Djamil Padang, it was found that more men suffer from glaucoma in diabetes because men tend to be less passive than women in the control and treatment of diabetes, thereby increasing the risk for glaucoma.[7]

In this study, based on the patient's age, it was found that the age group of 40-60 years had the most glaucoma in diabetes mellitus, namely 10 patients (84%) were 1 patient 8) was <40 years old and 1 patient (8%) was >60 years old. Risk factors for triggering and exacerbating glaucoma include age from 40 years, family history of glaucoma, myopia, hypermetropia, diabetes mellitus, hypertension, vasospasm, migraine, and corticosteroids central retinal vein obstruction, trauma, inflammation and eye surgery. The age group described that the flow of aqueous humour would be reduced by 30% during life and cause an increase in IOP. People aged >70 years are 3-8 times more

likely to develop primary open-angle glaucoma, while the age group of 55 to 65 is dominated by primary angle-closure glaucoma.[8]

Based on the type of diabetes mellitus in this study, all cases of glaucoma were found in type II diabetes. Type I and type II diabetes are at risk for diabetic retinopathy, cataracts, or glaucoma. Diabetes causes neurodegeneration where it will cause an increase in oxidative stress on eye cells which results in impaired vascularization and oxygen diffusion to eye cells. These things can cause damage to glial cells and endothelial cells of the eye resulting in hypoxia, resulting in changes in anatomy and nerve function in the eye. Type II diabetes causes an earlier depletion of the RNFL than individuals without diabetes.[9]

Based on the length of time patients had diabetes who had glaucoma, 11 (92%) had diabetes >5 years and 1 patient (8%) had diabetes <5 years. Zhao studied the duration of diabetes with the relationship of high risk of glaucoma. It was found that the longer the duration of a person affected by diabetes mellitus, the longer there will be damage to the eye's glial cells and neural function of the eye which will result in a higher risk of developing glaucoma.[10]

Conclusion

Based on the results of this study, it was concluded that there were more glaucoma sufferers in the male sex, where the most age group was 40-60 years, all glaucoma cases were found in patients with type II diabetes with the most duration of diabetes > 5 years.

Conflicts of Interest

Nothing to declare

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