

ORIGINAL ARTICLE

Risk Factors for Progressive Visual Field Loss in Primary Open-Angle Glaucoma: A Retrospective Cross-Sectional Study

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ABSTRACT

Aim: To assess the risk factors of visual field defects in primary open-angle glaucoma

Study design: A retrospective cross-sectional study

Place and Duration: Institute of Ophthalmology LUMHS, Jamshoro from May 2020 to April 2021

Methodology: This study comprised a total of 100 participants with glaucoma. Males outnumbered females in the gender distribution. Instead of using a formal definition defined by the investigators, a clinical diagnosis of POAG was used in this investigation. In the presence of gonioscopically open anterior chamber angles in both eyes, POAG was pragmatically defined as glaucomatous visual field defects (GVFD).

Results: Primary open-angle glaucoma affected 80 percent of men and 20 percent of women. The prevalence of open-angle glaucoma was 44 percent in the 55-65-year-old group, and 30 percent in the 45-54-year-old group. In 44 percent of instances, the eyesight loss lasted two years, whereas 31 percent had a one-year history. Hypertension was observed in 23.5 percent of patients with primary open-angle glaucoma, followed by myopia and diabetes.

Conclusion: It was observed that hypertension was the leading risk factor of Primary Open angle glaucoma, followed by myopia, family history, diabetes, and smoking.

Keywords: Glaucoma, risk factors, hypertension, diabetes

INTRODUCTION

Glaucoma is one of the most common causes of blindness [1 and 2]. It is a series of eye illnesses in which the optic nerve is damaged, eventually resulting in vision loss [3]. Open-angle glaucoma is the most prevalent type of glaucoma, and it progresses slowly. Closed-angle glaucoma is the second type, which has an abrupt onset and develops quickly and painfully. Hypertension, DM, myopia, a positive family history of obesity, and smoking are all risk factors for glaucoma. [4] The underlying process is increased intraocular pressure (IOP), which causes optic nerve injury. The aqueous humor exits slowly via the trabecular meshwork in open-angle glaucoma, whereas the iris inhibits the trabecular meshwork in close-angle glaucoma. Early detection, on the other hand, can prevent disease progression.

Because vision loss develops gradually and over a long period, glaucoma is known as the "silent thief of sight". Glaucoma affects roughly 2 million people in the United States, and it affects between 11 and 67 million people worldwide. [5, 6]

Because open-angle glaucoma is painless and does not have an acute attack, it is important to have regular eye exams to diagnose it [7]. On the other hand, closed-angle glaucoma is a medical emergency that produces ocular pain, halos around the eye, red eye, vomiting, and headache [8]. The current study was planned to determine the risk factors associated with Primary Open Angle Glaucoma (POAG).

METHODOLOGY

This retrospective cross-sectional study was conducted at the Institute of Ophthalmology, Liaquat University of Medical and Health Sciences, Jamshoro from May 2020 to April 2021. A total of 100 patients above the age of 35 years with primary open-angle glaucoma were included in the study. Permission was taken from the ethical review committee of the institute.

Case notes were acquired from the time of recruiting through the baseline evaluation. Instead of using a formal definition defined by the investigators, a clinical diagnosis of POAG was used in this investigation. In the presence of untreated intraocular pressures of 22mm Hg, POAG was pragmatically defined as glaucomatous visual field defects (GVFD).

These data were entered into a specially created proforma, resulting in a high level of data accuracy. Longitudinal data were observations taken regularly during standard clinical follow-up. This is a complex scoring system that is described in further depth elsewhere. [9]

Progression was defined as a change of four or more intervals from baseline that was verified on a retest, according to the scale's 95 percent test-retest reliability. [10] The first visual field test was omitted for all subjects, and the second test result was accepted [11]

The analysis was done per eye, with one eye from each patient included. Data from the eye with increasing loss was chosen for further study in participants with unilateral visual field defect progression. The data was analyzed using SPSS version 23.

RESULTS

Primary open-angle glaucoma affected 80 percent of males and 20 percent of females. The prevalence of open-angle glaucoma was 44 percent in the 55-65 age group, and 30 percent in the 45-54 age group. The urban population received 27 percent. (See Table 1 for more information.) In 44 percent of instances, the visual loss lasted two years, while 31 percent had a one-year history, 18 percent had a three-year history, 2% had a four-year history, and 1% had a seven-year history. (See Table 2 for more information.) Hypertension was shown to be a risk factor in 23.5 percent of cases (See Figure 1 for an example.) BCVA in the left eye was 6/6 in 25.8%, 6/9 in 15.5 percent, 6/12 in 6.2 percent, 6/18 in 6.2 percent, 6/24 in 6.2 percent, and 6/36 in 10.3 6/60 in 6.2 percent. (As seen in Figure 2)

Table 1: Demographic characteristics of the study participants

Gender	Percentage
Male	80
Female	20
Age (Years)	
40-44	7
45-54	30
55-56	44
>65	19

Area	
Urban	27
Rural	73

Table 2: Eye features of study participants

Duration of decreased vision (Years)	Percentage
<1	4
1	31
2	44
3	18
4	2
7	1
Eye involvement	
Right	3
Left	3
Both	94

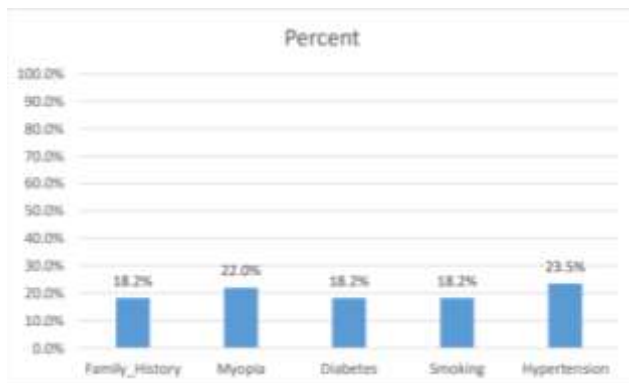


Figure 1: Risk factors of primary open-angle glaucoma



Figure 2: BCVA of both eyes

DISCUSSION

According to the study, primary open-angle glaucoma affected 80% of men and 20% of women. A study of glaucoma rates in central Iran in 2013 found a 37:50 male-to-female ratio in the prevalence of POAG [12]. According to age, 44 percent of people with open-angle glaucoma were between the ages of 55 and 65, 30 percent were between the ages of 45 and 54, 19 percent were beyond 65, and only 7% were between the ages of 40 and 44. In a similar local investigation, the total number of patients with primary open-angle glaucoma in the under 40-year-old age group was 2 (1.34 percent), in the 41-50-year-old age group was 29 (19.46 percent), in the 51-60-year-old age group was 47 (31.54 percent), and in the 61-70-year-old age group was 71. (47.65 percent) [13].

POAG and DM are both vascular disorders, and DM may signal the onset of POAG by predisposing individuals to vascular autoregulatory dysfunction and decreased endothelial factor release in the retinal, choroidal, and retrobulbar circulations. Only 4.4 percent of diabetic patients with glaucoma and DM were

observed in a short study in Yemen examining glaucomatous visual impairment in diabetic patients [14].

Late presentations (26%) were the major causes of blindness in patients with open-angle glaucoma (22.40%), followed by inability to purchase drugs (8.4%), refusal of surgery (10.60%), and treatment failure (10.60%) [15]. According to a meta-analysis of papers published between 1993 and 2019, most of the research found a link between HTN and glaucoma and optic nerve injury [16]. According to an Indian study [17], thirteen patients (32.5%) had hypertension, five (12.5%) had migraine, and seven (17.5%) had hyperlipidemia in patients with open-angle glaucoma.

A study of open-angle glaucoma patients in Italy discovered that characteristics such as family history, myopia, diabetes, and systemic hypertension were linked to bilateral VF damage [18]. According to a Swedish study, the presence of particular additional eye disorders such as secondary glaucoma, retinal vascular occlusion, or age-related macular degeneration enhanced the likelihood of severe vision loss and blindness in POAG patients [19].

CONCLUSION

When looking at the risk factors for glaucoma, it was discovered that hypertension was the leading risk factor, followed by myopia, family history, diabetes, and smoking.

Funding source: None

Conflict of interest: None

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