

Screening of Glaucoma in Patients Above 40 Years Attending OPD**Sandeep Rambhau Tathe****Professor, MBBS, MS Ophthalmology, Department of Ophthalmology, Malati Multispeciality Hospital and Medical College, Turkhed, Tq. Murtizapur, Dist. Akola, Maharashtra, India****Received: 11-04-2026 / Revised: 15-05-2026 / Accepted: 06-06-2026****Corresponding Author: Dr. Sandeep Rambhau Tathe****Conflict of interest: Nil****Abstract****Introduction:** Glaucoma is a chronic, progressive optic neuropathy characterized by degeneration of retinal ganglion cells and optic nerve head damage, leading to irreversible visual field loss. It is one of the leading causes of preventable blindness worldwide and is often asymptomatic in its early stages.**Aims & objectives:** The aim of this study was to screen patients aged above 40 years attending the OPD for early detection of glaucoma and to assess its association with various demographic factors and risk factors such as age, gender, systemic diseases, and ocular risk factors.**Materials & Methods:** A hospital-based observational cross-sectional study will be conducted in the Department of Ophthalmology, Kamineni Institute of Medical Sciences, Sreepuram, Narketpally, Nalgonda District, Telangana, India over a period of 1 year. The study will include a total sample size of 100 patients.**Result:** Symptom status showed a statistically significant association with glaucoma ($p = 0.002$). Glaucoma was detected in 12 patients (28.6%) among symptomatic individuals and in 3 patients (5.2%) among asymptomatic individuals.**Conclusion:** We concluded that hospital-based cross-sectional study comprising 100 patients aged above 40 years attending the ophthalmology OPD highlights the clinical and epidemiological profile of glaucoma and its associated risk factors. The findings demonstrate a statistically significant increase in glaucoma prevalence with advancing age, indicating age as a strong non-modifiable risk factor.**Keywords:** Glaucoma screening, Ophthalmology OPD, Intraocular pressure, Optic nerve damage, Visual field defects, Risk factors, Early detection.**DOI:** 10.25258/ijpqa.17.5.24

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Introduction

Glaucoma is a chronic, progressive optic neuropathy characterized by degeneration of retinal ganglion cells and optic nerve head damage, leading to irreversible visual field loss. It is one of the leading causes of preventable blindness worldwide and is often asymptomatic in its early stages. Because of this silent progression, it is commonly referred to as the "silent thief of sight." Early detection through screening is essential to prevent permanent visual impairment.[1] Glaucoma is particularly important in individuals above 40 years of age, as increasing age is a major risk factor for disease development. The prevalence of primary open-angle glaucoma increases steadily with age, and many patients remain undiagnosed until advanced optic nerve damage has already occurred. In OPD settings, a considerable proportion of patients attending for routine eye complaints may harbor undiagnosed glaucoma, making opportunistic screening in this age group highly valuable. Globally, glaucoma remains a major public health problem. It is estimated that

millions of people are affected worldwide, and a significant proportion remain undiagnosed. Quigley and Broman reported that the global burden of glaucoma is expected to rise significantly due to population aging and increasing life expectancy, emphasizing the importance of early detection strategies in high-risk populations such as individuals above 40 years [1]. Foster et al. also highlighted that primary open-angle glaucoma is particularly underdiagnosed in community settings, especially in developing countries where awareness and screening coverage are limited [2]. Screening for glaucoma in OPD settings typically includes measurement of intraocular pressure using tonometry, assessment of the optic disc for increased cupping, evaluation of the anterior chamber angle when required, and visual field testing in suspected cases. These methods help in identifying early or pre-perimetric glaucoma, allowing timely intervention to prevent progression of optic nerve damage. Several risk factors are associated with glaucoma, including older age,

positive family history, diabetes mellitus, systemic hypertension, myopia, and long-term corticosteroid use. Coleman and Miglior emphasized that both ocular and systemic risk factors play a significant role in disease development and progression, highlighting the importance of targeted screening strategies [3]. Early identification of such individuals in OPD can significantly improve detection rates.

Materials and Methods

Type of Study: A hospital-based observational cross-sectional study

Place of Study: Department of Ophthalmology, Kamineni Institute of Medical Sciences, Sreepuram, Narketpally, Nalgonda District, Telangana State, India.

Study Duration: 1 year

Sample Size: 100 patients

Inclusion Criteria

- Patients aged ≥ 40 years attending OPD during the study period
- Both male and female patients
- Patients giving informed consent for participation
- Patients attending OPD for routine eye examination or refractive complaints
- Patients willing to undergo glaucoma screening tests

Exclusion Criteria

- Patients already diagnosed with Glaucoma and on treatment
- Patients with media opacities preventing proper fundus evaluation

- Patients with recent ocular trauma or ocular surgery (<6 months)
- Patients unwilling to participate or not giving consent
- Patients with severe systemic illness preventing ophthalmic examination

Study Variables

- Presence or absence of glaucoma
- Age
- Gender
- Family history of glaucoma
- Diabetes mellitus
- Systemic hypertension
- History of steroid use
- Myopia/refractive error status
- Intraocular pressure (IOP)
- Optic disc assessment
- Visual field defects
- Anterior chamber angle status

Statistical Analysis: Data were entered into Excel and subsequently analyzed using SPSS and GraphPad Prism. Continuous variables were summarized as means with standard deviations, while categorical variables were presented as counts and percentages. Comparisons between independent groups were performed using two-sample t-tests, and paired t-tests were applied for correlated (paired) data. Categorical data were compared using chi-square tests, with Fisher's exact test applied when expected cell counts were small. A p-value of ≤ 0.05 was considered statistically significant.

Result

Table 1: Age group and Gender vs glaucoma status

Variable	Category	Glaucoma	No glaucoma	p-value
Age group	40–49	1 (5.6%)	17 (94.4%)	0.043
	50–59	2 (8.3%)	22 (91.7%)	
	60–69	6 (18.8%)	26 (81.3%)	
	70–79	5 (25.0%)	15 (75.0%)	
	≥ 80	1 (16.7%)	5 (83.3%)	
Gender	Male	9 (16.7%)	45 (83.3%)	0.516
	Female	6 (13.0%)	40 (87.0%)	

Table 2: Risk factors associated with glaucoma (n = 100)

Risk factor	Glaucoma present	No glaucoma	p-value
Family history	6 (40.0%)	9 (60.0%)	0.004
Diabetes mellitus	4 (22.2%)	14 (77.8%)	
Hypertension	3 (21.4%)	11 (78.6%)	
Myopia	1 (11.1%)	8 (88.9%)	
Steroid use	1 (25.0%)	3 (75.0%)	
No risk factor	0 (0.0%)	40 (100.0%)	

Table 3: Visual field defect vs glaucoma status

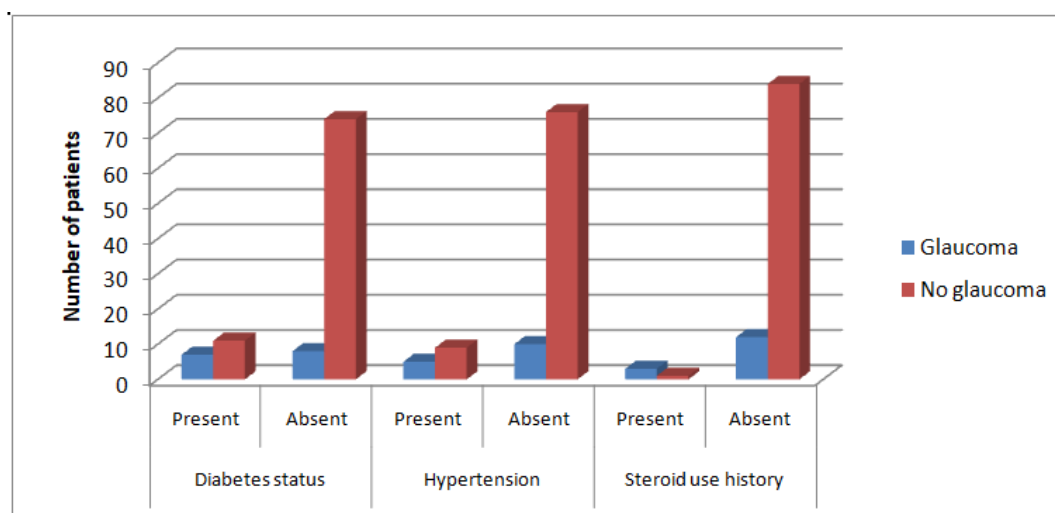
Visual field status	Glaucoma	No glaucoma	p-value
Normal	2 (2.8%)	70 (97.2%)	<0.0001
Early defect	5 (33.3%)	10 (66.7%)	
Moderate loss	5 (62.5%)	3 (37.5%)	
Advanced loss	3 (60.0%)	2 (40.0%)	

Table 4: Symptom status vs glaucoma detection

Symptoms	Glaucoma	No glaucoma	p-value
Symptomatic	12 (28.6%)	30 (71.4%)	0.002
Asymptomatic	3 (5.2%)	55 (94.8%)	

Table 5: Diabetes mellitus, Hypertension, Steroid use history vs glaucoma

Variable	Category	Glaucoma	No glaucoma	p-value
Diabetes status	Present	7 (38.9%)	11 (61.1%)	0.003
	Absent	8 (9.8%)	74 (90.2%)	
Hypertension	Present	5 (35.7%)	9 (64.3%)	0.021
	Absent	10 (11.6%)	76 (88.4%)	
Steroid use history	Present	3 (75.0%)	1 (25.0%)	0.008
	Absent	12 (12.5%)	84 (87.5%)	

**Figure 1: Diabetes mellitus, Hypertension, Steroid use history vs glaucoma**

A total of 100 patients were evaluated in this study. The association between age group and glaucoma status showed a statistically significant relationship ($p = 0.043$). In the 40–49 years group, 1 patient (5.6%) had glaucoma and 17 patients (94.4%) had no glaucoma. In the 50–59 years group, 2 patients (8.3%) had glaucoma and 22 patients (91.7%) had no glaucoma. In the 60–69 years group, 6 patients (18.8%) had glaucoma and 26 patients (81.3%) had no glaucoma. In the 70–79 years group, 5 patients (25.0%) had glaucoma and 15 patients (75.0%) had no glaucoma, while in the ≥ 80 years group, 1 patient (16.7%) had glaucoma and 5 patients (83.3%) had no glaucoma. Glaucoma prevalence increased with age. Gender did not show a statistically significant association with glaucoma ($p = 0.516$). Among males, 9 patients (16.7%) had glaucoma and 45 patients (83.3%) had no glaucoma, while among females, 6 patients (13.0%) had glaucoma and 40 patients (87.0%) had

no glaucoma. Among risk factors, family history showed a strong and statistically significant association with glaucoma ($p = 0.004$), with 6 patients (40.0%) with glaucoma and 9 patients (60.0%) without glaucoma having a positive family history. Diabetes mellitus was present in 4 patients (22.2%) with glaucoma and 14 patients (77.8%) without glaucoma. Hypertension was present in 3 patients (21.4%) with glaucoma and 11 patients (78.6%) without glaucoma. Myopia was noted in 1 patient (11.1%) with glaucoma and 8 patients (88.9%) without glaucoma. Steroid use was present in 1 patient (25.0%) with glaucoma and 3 patients (75.0%) without glaucoma, while all 40 patients (100.0%) without any risk factors had no glaucoma. Visual field status showed a highly significant association with glaucoma ($p < 0.0001$). In the normal field group, 2 patients (2.8%) had glaucoma and 70 patients (97.2%) had no glaucoma. In early visual field defect, 5 patients

(33.3%) had glaucoma and 10 patients (66.7%) had no glaucoma. In moderate loss, 5 patients (62.5%) had glaucoma and 3 patients (37.5%) had no glaucoma, while in advanced loss, 3 patients (60.0%) had glaucoma and 2 patients (40.0%) had no glaucoma. Symptom status was significantly associated with glaucoma detection ($p = 0.002$). Among symptomatic patients, 12 patients (28.6%) had glaucoma and 30 patients (71.4%) had no glaucoma, whereas among asymptomatic patients, 3 patients (5.2%) had glaucoma and 55 patients (94.8%) had no glaucoma. Systemic and medication-related risk factors also showed significant associations. In diabetes mellitus, 7 patients (38.9%) had glaucoma and 11 patients (61.1%) had no glaucoma ($p = 0.003$). In hypertension, 5 patients (35.7%) had glaucoma and 9 patients (64.3%) had no glaucoma ($p = 0.021$). In steroid use history, 3 patients (75.0%) had glaucoma and 1 patient (25.0%) had no glaucoma ($p = 0.008$).

Discussion

In this hospital-based screening study of 100 patients above 40 years attending the OPD, glaucoma prevalence showed a significant increasing trend with age ($p = 0.043$). Age-related rise in glaucoma prevalence has been consistently demonstrated in recent literature. A large systematic review by Shan S et al. (2024) reported that advancing age is one of the strongest and most consistent risk factors for primary open-angle glaucoma globally, with incidence rising significantly after 60 years [4]. Similarly, Rovelt J et al. (2025) in an umbrella review of risk factors for primary glaucoma confirmed that age-related neurodegenerative susceptibility of retinal ganglion cells plays a central role in disease progression [5]. In the present study, gender did not show a statistically significant association with glaucoma ($p = 0.516$). This finding is consistent with recent meta-analytic evidence. Shen RY et al. (2025) reported that while slight sex-based differences exist in some populations, overall pooled evidence does not support a strong independent association between gender and primary glaucoma risk [6]. This suggests that hormonal or anatomical differences may be less influential compared to systemic vascular and genetic factors. Family history showed a strong and statistically significant association with glaucoma ($p = 0.004$). Genetic susceptibility has been strongly reinforced in recent research. Rovelt J et al. (2025) highlighted that inherited genetic variants affecting trabecular meshwork function and optic nerve susceptibility significantly increase risk of primary open-angle glaucoma [5]. Similarly, Wiggs JL (2017) demonstrated that multiple gene loci contribute to glaucoma susceptibility, supporting a strong hereditary component in disease development

[7]. Among systemic risk factors, diabetes mellitus and hypertension showed significant associations in the present study ($p = 0.003$ and $p = 0.021$ respectively). Recent evidence supports these findings. Al Darrab A et al. (2023) in a meta-analysis found that diabetes, longer disease duration, and elevated fasting glucose are significantly associated with increased risk of glaucoma [8]. Additionally, Leung G et al. (2023) reported that systemic hypertension and vascular dysregulation may contribute to optic nerve perfusion abnormalities, thereby increasing glaucoma susceptibility [9]. Steroid use history showed a strong association with glaucoma in this study ($p = 0.008$). This is well established in recent literature. Vinokurtseva A et al. (2022) demonstrated that both inhaled and systemic corticosteroids significantly increase the risk of ocular hypertension and secondary glaucoma due to trabecular meshwork resistance and impaired aqueous outflow [10]. StatPearls review (Feroze KB et al., 2023) also confirms steroid-induced elevation of intraocular pressure as a major reversible risk factor for secondary glaucoma [11]. Visual field status showed a highly significant association with glaucoma severity ($p < 0.0001$). Progressive visual field loss is a hallmark of glaucomatous damage. Anderson D et al. (2020, updated analyses from EMGT follow-up studies) confirmed that visual field deterioration correlates strongly with disease progression and untreated intraocular pressure elevation [12]. Similarly, recent umbrella reviews (Shen RY et al., 2025) emphasize that structural and functional progression occur in parallel in glaucoma patients [6]. Symptom status was also significantly associated with glaucoma detection ($p = 0.002$). However, a substantial proportion of asymptomatic patients were diagnosed with glaucoma, highlighting the silent progression of the disease. Recent population-based evidence shows that glaucoma often remains undetected until late stages due to its asymptomatic nature in early disease (Rovelt J et al., 2025) [5].

Conclusion

We concluded that hospital-based cross-sectional study comprising 100 patients aged above 40 years attending the ophthalmology OPD highlights the clinical and epidemiological profile of glaucoma and its associated risk factors. The findings demonstrate a statistically significant increase in glaucoma prevalence with advancing age, indicating age as a strong non-modifiable risk factor. Although gender did not show a significant association, males and females were nearly equally affected. Among systemic and ocular risk factors, family history exhibited a highly significant association with glaucoma, underscoring its genetic predisposition. Diabetes mellitus and hypertension

were also significantly associated, suggesting their contributory role in optic nerve vulnerability. Steroid use emerged as a strong modifiable risk factor. Visual field status showed a highly significant correlation with glaucoma severity, reinforcing its importance in both diagnosis and staging of disease progression. Symptomatic patients had a higher detection rate compared to asymptomatic individuals, emphasizing the need for opportunistic screening. The study concludes that systematic screening in individuals above 40 years, particularly those with risk factors, is essential for early detection and prevention of irreversible glaucomatous vision loss.

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