

# Analysis of Prevalence of Glaucoma among Patients Attending Ophthalmology Department: An Institutional Based Study

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## ABSTRACT

**Background:** Glaucoma is a group of optic neuropathies involving progressive degeneration of retinal ganglion cells, leading to optic disc cupping and visual loss. Hence; the present study was conducted to analyze prevalence of glaucoma among patients attending ophthalmology department.

**Materials & Methods:** This study investigated the prevalence of glaucoma among 200 patients aged 20-60 who visited Department of Ophthalmology, Heritage Institute of Medical Sciences, Varanasi, Uttar Pradesh, India. A comprehensive ocular assessment was conducted, including tonometry to measure eye pressure, ophthalmoscopy to examine the optic disc for potential damage, and perimetry to evaluate the field of vision. Based on these diagnostic findings, the study aimed to determine the prevalence of glaucoma in the study population, providing valuable insights into its occurrence and potential risk factors. All the results were recorded in Microsoft excel sheet and was subjected to statistical analysis using SPSS software. Chi-square test was used for evaluation of level of significance.

**Results:** A total of 200 patients were evaluated. Mean age of the patients was 38.2 years. 57.5 percent of the patients were of urban residence while the remaining was of rural residence. 61.5 percent of the patients were males while the remaining were females. Glaucoma was present in 28 percent of the

patients. Significant correlation of glaucoma was seen with higher age.

**Conclusion:** Glaucoma poses significant challenges due to late diagnosis, often after irreversible vision loss, and high treatment costs. Limited access to eye care services, low awareness, and restricted treatment options further exacerbate the issue, underscoring the need for improved healthcare infrastructure and public education.

**Key words:** Glaucoma, Eye.

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## INTRODUCTION

Glaucoma is a group of optic neuropathies involving progressive degeneration of retinal ganglion cells, leading to optic disc cupping and visual loss. Despite its impact, the biological basis of glaucoma remains poorly understood, and the factors driving its progression are not yet fully characterized, highlighting the need for further research.<sup>1</sup>

A systematic review found key risk factors for primary open-angle glaucoma include an increased cup-disk ratio, CDR asymmetry, disc hemorrhage, elevated intraocular pressure, family history, Black race, and advanced age. These factors can help identify individuals at higher risk for the disease. Glaucoma can occur even with normal intraocular pressure, potentially due to low cerebrospinal fluid pressure around the optic nerve, creating a pressure gradient. Other contributing factors may include impaired

microcirculation, altered immunity, excitotoxicity, and oxidative stress. Neural degeneration can also trigger secondary damage to other retinal and central visual pathway cells.<sup>2,3</sup>

Elevated intraocular pressure is a significant risk factor for glaucoma, yet many individuals with glaucoma have normal or low pressures, and conversely, many with high pressure never develop the disease. Glaucoma often progresses asymptotically until advanced stages, emphasizing the importance of early intervention and referral to an eye care practitioner for at-risk patients to slow disease progression and preserve vision.<sup>4,5</sup>

Primary care physicians play a crucial role in identifying patients at risk for glaucoma, particularly those with a family history. They should refer such patients for a comprehensive ophthalmologic

examination if they haven't had a dilated funduscopy exam in the past 2 years. Additionally, primary care physicians can perform direct ophthalmoscopy to evaluate the optic nerve and refer patients with suspicious findings to an ophthalmologist for further evaluation.<sup>6</sup> Hence; the present study was conducted to analyze prevalence of glaucoma among patients attending ophthalmology department.

## MATERIALS & METHODS

This study investigated the prevalence of glaucoma among 200 patients aged 20-60 who visited Department of Ophthalmology, Heritage Institute of Medical Sciences, Varanasi, Uttar Pradesh, India. A comprehensive ocular assessment was conducted, including tonometry to measure eye pressure, ophthalmoscopy to examine the optic disc for potential damage, and perimetry to

evaluate the field of vision. Based on these diagnostic findings, the study aimed to determine the prevalence of glaucoma in the study population, providing valuable insights into its occurrence and potential risk factors. All the results were recorded in Microsoft excel sheet and was subjected to statistical analysis using SPSS software. Chi-square test was used for evaluation of level of significance.

## RESULTS

A total of 200 patients were evaluated. Mean age of the patients was 38.2 years. 57.5 percent of the patients were of urban residence while the remaining was of rural residence. 61.5 percent of the patients were males while the remaining were females. Glaucoma was present in 28 percent of the patients. Significant correlation of glaucoma was seen with higher age.

**Table 1: Demographic data**

| Demographic data | Number | Percentage |
|------------------|--------|------------|
| Mean age (years) | 38.2   |            |
| Male             | 123    | 61.5       |
| Females          | 77     | 38.5       |
| Rural residence  | 85     | 42.5       |
| Urban residence  | 115    | 57.5       |

**Table 2: Prevalence of glaucoma**

| Glaucoma | Number | Percentage |
|----------|--------|------------|
| Present  | 56     | 28         |
| Absent   | 144    | 72         |
| Total    | 200    | 100        |

**Table 3: Glaucoma and demographic data**

| Variable         | Glaucoma present | Glaucoma absent | p-value             |
|------------------|------------------|-----------------|---------------------|
| Mean age (years) | 35.9             | 46.2            | 0.010 (Significant) |
| Male             | 30               | 93              | 0.225               |
| Females          | 26               | 51              |                     |
| Rural residence  | 25               | 60              | 0.162               |
| Urban residence  | 31               | 84              |                     |

## DISCUSSION

Glaucoma is a chronic eye disease that results in irreversible optic nerve damage, which causes severe vision loss and blindness. It is the second leading cause of blindness world-wide and one of the leading causes of irreversible blindness. The estimated number of people around the world with glaucoma was 64.3 million in 2013, and this number is expected to increase to 111.8 million in 2040. The increasing trend in the number of patients with glaucoma will continue because of increased life expectancy. In recently published systematic reviews, the glaucoma prevalence in subjects >40 years of age was estimated to be 3.54% globally and 3.40% in Asia. Most studies examining the prevalence of glaucoma have been population-based, but these may be limited in determining glaucoma prevalence in real world because of differences in setting of glaucoma diagnosis between clinical

practice and population-based studies. In additional, population-based studies varied widely in terms of the eye examination methods and case definitions used.<sup>7-9</sup>

A total of 200 patients were evaluated. Mean age of the patients was 38.2 years. 57.5 percent of the patients were of urban residence while the remaining was of rural residence. 61.5 percent of the patients were males while the remaining were females. Glaucoma was present in 28 percent of the patients. Significant correlation of glaucoma was seen with higher age. Seo SJ et al estimated the prevalence of glaucoma and costs associated with glaucoma. The prevalence of glaucoma and direct medical costs associated with glaucoma care were estimated. The prevalence of glaucoma in patients ≥40 years of age increased from 0.79% in 2008 to 1.05% in 2013. The number of patients with glaucoma increased by 54% between 2008 and 2013 (9% average annual

increase). The prevalence of glaucoma increased with age and was higher in males than in females. The cost to care for glaucoma patients increased from \$16.5 million in 2008 to \$29.2 million in 2013, which translated into an 81% increase over the 6 years examined (12.7% average annual increase). The estimated prevalence and socioeconomic burden of glaucoma have steadily increased each year.<sup>10</sup>

Usifoh et al assessed the current prevalence of glaucoma and the effect of gender and age on primary open angle glaucoma (POAG). A retrospective survey of all new patients at the eye clinic was conducted using their medical records for a period of six months. A total of 2,305 new patients visited the eye clinic for the period, out of this total 1203 (52.2%) are male and 1102 (47.81%) are female. Two hundred and seventeen (9.4%) patients were diagnosed with glaucoma out of which 115 (53%) were male while 102 (47%) were female. Primary Open Angle Glaucoma (POAG) was the most common type of glaucoma (91.24%), followed by Normal Tension Glaucoma (NTG) with a prevalence of 3.23%. No significant association was found between age or sex and types of glaucoma. PACG and Juvenile glaucoma remains relatively rare accounting for only 1.84% each in types of glaucoma. There was a monthly glaucoma prevalence increase from 10 to 26.64 % which appears to indicate that glaucoma prevalence is on the rise.<sup>11</sup> Friedman et al determined the prevalence of glaucoma among black and white persons 73 years and older. The main outcome measure was glaucoma, based on optic nerve damage and visual field loss or obvious glaucomatous optic neuropathy without an available, reliable, reproducible visual field. A total of 1250 individuals (95.9% of those eligible) participated, 1233 (98.6%) of whom agreed to screening and an eye examination. The prevalence (95% confidence interval) of open-angle glaucoma was 3.4% (0.5%-6.4%) for white individuals aged 73 and 74 years, increasing to 9.4% (7.4%-11.5%) for those 75 years and older. There was no increasing prevalence in those older than 75 years. Among black persons, the prevalence (95% confidence interval) was 5.7% (0%-11.9%) in those aged 73 and 74 years and 23.2% (17.8%-28.5%) in those 75 years and older. Many older individuals have open-angle glaucoma, and black persons 75 years and older have substantially higher rates than whites. These findings have important implications for public health initiatives, in which screening programs may be of benefit.<sup>12</sup>

## CONCLUSION

Glaucoma poses significant challenges due to late diagnosis, often after irreversible vision loss, and high treatment costs. Limited access to eye care services, low awareness, and restricted treatment options further exacerbate the issue, underscoring the need for improved healthcare infrastructure and public education.

## REFERENCES

1. Johnson GJ, Minassian DC, Weale R (1998). The epidemiology of Eye disease, Chaman and Hall Medical Hippincott-Raen Publisher: London, Chapter 8, 1998, p.76.

2. D. L. Budenz, K. Barton, J. Whiteside-De Vos et al. Prevalence of Glaucoma in an Urban West African Population: The Tema Eye Survey. *JAMA Ophthalmology* 2013; 131(5): 651–658.
3. Kaimbo Wa Kaimbo D., Missolten L. Glaucoma in Congo. *Bull. Soc. Belge Ophthalmol* 1997; 267: 21 – 26.
4. C. S. Kim, G. J. Seong, N. H. Lee, and K. C. Song, Prevalence of primary open-angle glaucoma in central South Korea the Namil study. *Ophthalmology* 2011; 118(6): 1024–1030.
5. Spaeth GL, Hwang S, Gomes M. Pathogenesis and risk factors in glaucoma. Berlin: Springer, 1999; 135-44. Tielsch JM, Sonmer A Katz J, Royall RM, Quigley HA, Javitt J, (1991). Racial variation in the prevalence of POAG; 266:369-374.
6. Shuttleworth GN, Khong CH, Diamond JP. A new digital optic disc stereo camera: intraobserver and interobserver repeatability of optic disc measurements. *Br J Ophthalmol* 2000; 84:403- 407.
7. Mitchell P, Hayes P, Wang JJ. Visual impairment in nursing home residents: the Blue Mountains Eye Study. *Med J Aust* 1997;166:73- 76.
8. Van Newkirk MR, Weih L, McCarty CA, Stanislavsky YL, Keeffe JE, Taylor HR. Visual impairment and eye diseases in elderly institutionalized Australians. *Ophthalmology* 2000;107:2203- 2208.
9. R. N. Weinreb, T. Aung, and F. A. Medeiros. The pathophysiology and treatment of glaucoma: a review. *The Journal of the American Medical Association* 2014; 311(18): 1901–1911.
10. Seo SJ et al. Estimated Prevalence of Glaucoma in South Korea Using the National Claims Database. *J Ophthalmology*. 2016; :1690256.
11. Usifoh SF et al. Prevalence of glaucoma in a Nigerian hospital. *Journal of pharmacy and bioresources*. 2014; 11(1): 22-28.
12. Friedman DS, Jampel HD. The Prevalence of Open-angle Glaucoma Among Blacks and Whites 73 Years and Older: The Salisbury Eye Evaluation Glaucoma Study. *Arch Ophthalmol*. 2006;124(11):1625-1630.

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