

## An Epidemiological Study (Cross-sectional Study) of Glaucoma in a Semi-urban Population of Delhi

Anurag Narula\*, Vemparala Rajshekhar, Shilpa Singh and Sunil Chakravarty

Vardhman Mahavir Medical College and Safdarjung Hospital, Delhi, India

\*Corresponding author: Anurag Narula, Vardhman Mahavir Medical College and Safdarjung Hospital, Delhi, India, Tel: 919990770479; E-mail: ananuragnarula@rediffmail.com

Received date: July 25, 2017; Accepted date: October 03, 2017; Published date: October 16, 2017

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### Abstract

**Aim:** The purpose of this study was to study the epidemiology of glaucoma in a semi urban population of delhi.

**Methods:** 24651 patients attending the eye OPD of Attar Sain Jain Eye and General Hospital, Govt of NCT of Delhi were screened and treated for glaucoma over a period of 6 months-from 1st July to 31st December, 2013.

**Results:** Total of 261 cases of all types of glaucoma was identified. Out of these 43 were angle closure glaucoma and 218 were open angle glaucoma. Newer cases diagnosed were 118(78 of open angle glaucoma and 30 of angle closure glaucoma). Thus the overall incidence was 4.79 cases per 1000 population. Overall prevalence of glaucoma was 10.59 cases per 1000 population. The overall male to female distribution was 121 male cases to 140 female cases but this figure was skewed towards 30 females to 13 males in case of angle closure. Family history for glaucoma was positive in 73 percent of all cases (191 cases). Two cases required surgery and 32 cases required laser iridotomy (new and augmentation). 62 percent of the overall patients were diabetics and 32 percent were smokers.

**Conclusion:** Glaucoma is one of the leading causes of blindness in the world and India and is a silent killer of the eye. There is a lack of glaucoma epidemiological and risk factor studies and more such studies are required with larger population base and longer duration to have an assessment of the burden of glaucoma. Initiatives to increase public awareness and comprehensive eye examinations by ophthalmologists are the key to reducing or eliminating undiagnosed glaucoma. If all ophthalmologists perform comprehensive eye examinations (that includes basic slit-lamp examination, intraocular pressure (IOP) measurement, pachymetry, gonioscopy and dilated fundus examination), we can definitely minimize under-diagnosis.

**Keywords:** Glaucoma; Epidemiology

### Introduction

Over the last decade the prevalence of glaucoma has been reported by the Vellore Eye Survey, Andhra Pradesh Eye Disease Study, Aravind Comprehensive Eye Survey, Chennai Glaucoma Study, and West Bengal Glaucoma Study. There have been some differences largely because of methodologic variations. We use the reported age and gender stratified prevalence estimates from these studies and the Indian population census estimates to calculate the number of persons with glaucoma or at risk of the disease in the country. On the basis of the available data, we estimate that there are approximately 11.2 million persons aged 40 years and older with glaucoma in India. Primary open angle glaucoma is estimated to affect 6.48 million persons. The estimated number with primary angle-closure glaucoma is 2.54 million. Those with any form of primary angle-closure disease could comprise 27.6 million persons. Most of those with disease are undetected and there exist major challenges in detecting and treating those with disease. In the light of the existing manpower and resource constraints, we evaluate options for improving case detection rates in the country [1].

Glaucoma is a chronic progressive optic neuropathy which is characterized by typical optic disc and retinal nerve fiber layer (RNFL)

changes with correlating visual field defects wherein intraocular pressure (IOP) is a major risk factor. It is the second leading cause of blindness. About half the glaucoma patients in a community remain undiagnosed worldwide and in our country this figure is around 90%. On the one hand nearly 50-90% of true glaucoma patients remain undiagnosed; on the other hand, nearly half of the "glaucoma patients" using ocular hypotensive medication do not need the medications or are over-treated. With the above figures it is obvious that under-diagnosis and over-treatment are quite common. The issue gets more complex due to the high percentage of non-compliant patients. The effects of under-diagnosis are obvious but the implications of over-treatment are far more deleterious as it increases the cost of treatment, affects the quality of life and subjects patients to the risks of side-effects without much gain. The purpose of this editorial is to highlight the issue of under-diagnosis and over-treatment, so that it can be avoided [1].

Under-diagnosis of glaucoma is either a result of patients not presenting to their ophthalmologist at all or on time, or ophthalmologists missing the diagnosis. Unfortunately, this issue itself is multifaceted. In many cases, patients do not understand the crucial importance of preventive eye care or are not aware of their own risk for glaucoma. In other cases, some patients do not have access to professional eye care because of insufficient financial resources or no means of transportation [1].

An epidemiological study was undertaken keeping in mind paucity of such study in North Indian population. Study was carried out at Attar Sain Jain Eye and General Hospital, Govt of NCT of Delhi were screened and treated for glaucoma over a period of 6 months-from 1st July to 31st December, 2013.

### Materials and Methods

24651 patients attending the eye OPD of Attar Sain Jain Eye and General Hospital, Govt of NCT of Delhi were screened and treated for glaucoma over a period of 6 months-from 1st July to 31st December, 2013. Out of 261 glaucoma patients 140(53.6%) were Female and 121(46.4%) were Male. A Cross-Sectional Study was carried out.

Mean Age of a diagnosed patients was 57, it being on a n average 55 for open angle patients and 58 for closed angle patients. Female patients constituted the larger portion of closed angle patients contributing 30 out of 43 patients nearly 70 percent. Patients were classified into open and closed angle based on gonioscopy utilizing schaffer's grading of angles. Risk factors assessed were family history, smoking, diabetes and hypertension.

### Results

Total of 261 cases of all types of glaucoma were identified. Out of these 43 were angle closure glaucoma and 218 were open angle glaucoma (Figure 1). Newer cases diagnosed were 118 (78 of open angle glaucoma and 30 of angle closure glaucoma) (Figure 2). Thus the overall incidence was 4.79 cases per 1000 population.

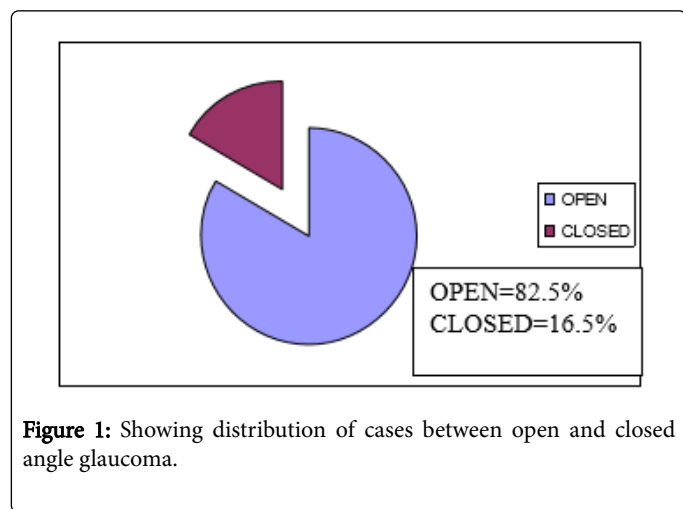


Figure 1: Showing distribution of cases between open and closed angle glaucoma.

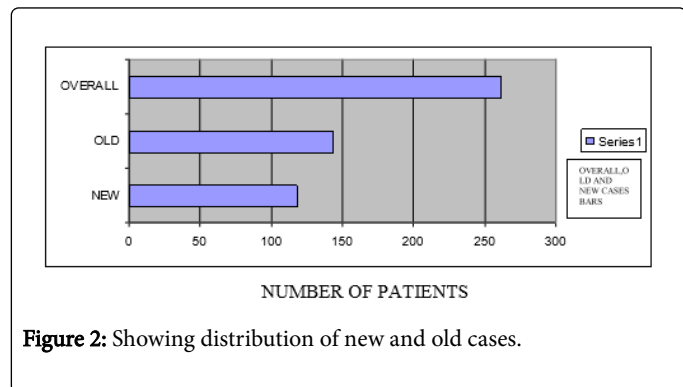


Figure 2: Showing distribution of new and old cases.

Overall prevalence of glaucoma was 10.59 cases per 1000 population. The overall male to female distribution was 121 male cases to 140 female cases (Figure 3) but this figure was skewed towards female side in case of angle closure-30 females to 13 males in case of angle closure (Figure 4).

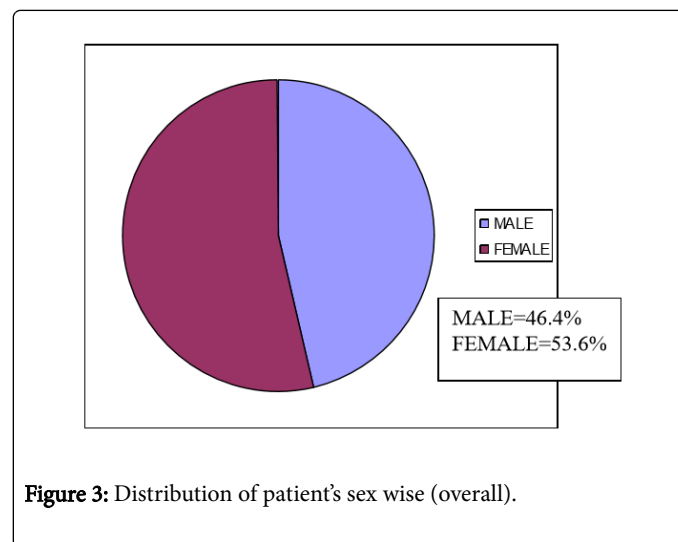


Figure 3: Distribution of patient's sex wise (overall).

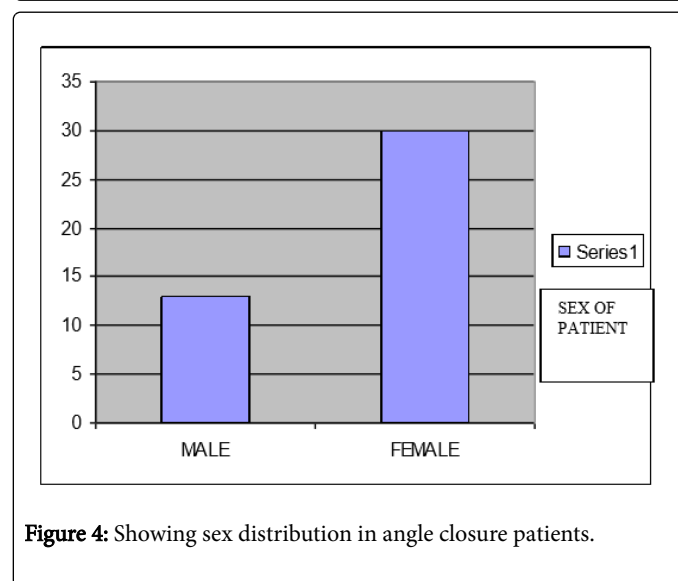


Figure 4: Showing sex distribution in angle closure patients.

Family history for glaucoma was positive in 73 percent of all cases (191 cases). 62 percent of the overall patients were diabetics and 32 percent were smokers (Figure 5). 2 cases required surgery and 32 cases required laser iridotomy (new and augumentation) (Figure 6).

### Discussion

It is estimated that there are more than 60 million cases of glaucoma worldwide and it will increase to 80 million by 2020 [2]. The estimated prevalence of glaucoma is 2.65% in people above 40 years of age. Globally, Primary Open-Angle Glaucoma (POAG) is more prevalent than primary angle closure glaucoma (PACG) and responsible for around three fourth of all glaucoma cases. Overall glaucoma is the second major cause of blindness after cataract and refractive errors [3]. More importantly it is the most common cause of irreversible

blindness globally. It is estimated that more than 3 million people are blind due to glaucoma [3].

In India, the estimated number of cases of glaucoma is 12 million, around one fifth of the global burden of glaucoma. Although in the Caucasian population, around two third of cases are POAG, in the Indian population an equal proportion of open-angle and closed-angle glaucoma is seen [2]. The prevalence of POAG in rural south India among 40+ population was estimated as 1.7% in the ACES study [4]. In our study all patients were above 40 years with Mean Age of a diagnosed patients was 57, it being on a n average 55 for open angle patients and 58 for closed angle patients.

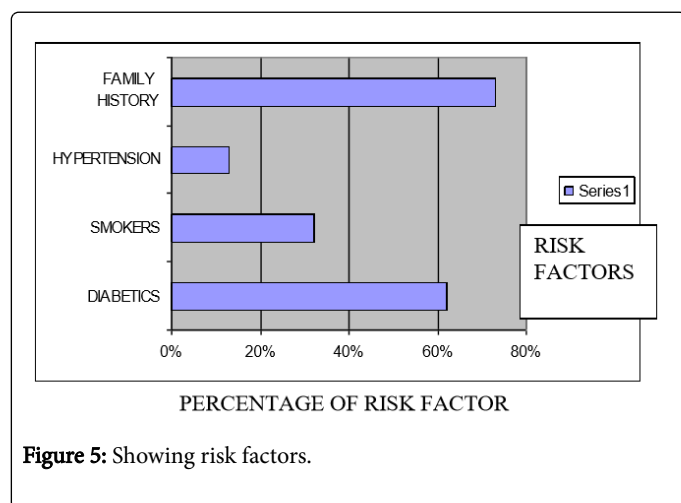


Figure 5: Showing risk factors.

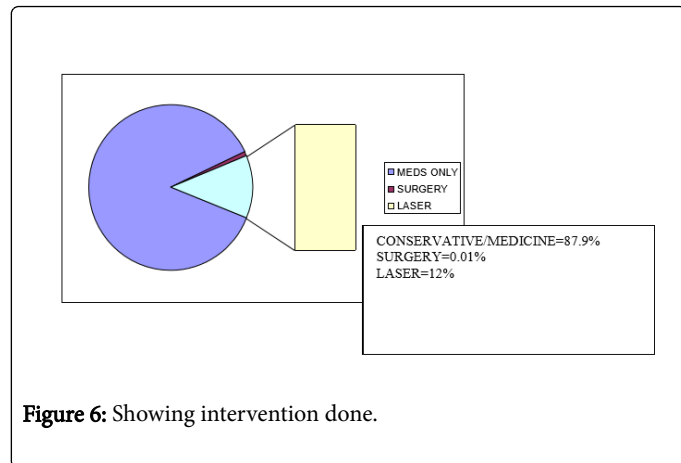


Figure 6: Showing intervention done.

The prevalence was comparatively higher in the urban south India-Chennai Glaucoma Study (3.5%) [5]. In our study the overall incidence was 4.79 cases per 1000 population and overall prevalence of glaucoma was 10.59 cases per 1000 population. There is a gross difference in this statistical data due to the fact that glaucoma remains underdiagnosed

and undertreated in most of the rural and semi urban areas due to lack of publicity, knowledge among people and lack of technical staff and equipment required for diagnosis.

More importantly it was observed that more than 90% cases of glaucoma were undiagnosed and identified only at the time of survey (98.6% in the Chennai Glaucoma Study and 93% in ACES). The National Blindness survey 2001 showed that glaucoma is the third major cause of blindness in India and responsible for 5.9% of blindness (VA<6/60) [6]. There has been a more than threefold increase in proportion of glaucoma blindness compared to that found in the previous National survey in 1986-1989.

Initiatives to increase public awareness and comprehensive eye examinations by ophthalmologists are the key to reducing or eliminating undiagnosed glaucoma. If all ophthalmologists perform comprehensive eye examinations (that includes basic slit-lamp examination, intraocular pressure (IOP) measurement, pachymetry, gonioscopy and dilated fundus examination), we can definitely minimize under-diagnosis.

## Conclusion

Glaucoma is the second leading cause of blindness in the world accounting for upto 8% of total blindness. In India, glaucoma is the leading cause of irreversible blindness with atleast 12 million people affected and nearly 1.2 million people blind from the disease. More than 90 percent of cases of glaucoma remain undiagnosed in the community. There is a lack of glaucoma epidemiological and risk factor studies and more such studies are required with larger population base and longer duration to have an assessment of the burden of glaucoma. Initiatives to increase public awareness and comprehensive eye examinations by ophthalmologists are the key to reducing or eliminating undiagnosed glaucoma.

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