

## A Cross-Sectional Study of Field Defects in Primary Open Angle Glaucoma Among the Patients Attending a Tertiary Care Hospital in Andhra Pradesh

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### Abstract

**Background:** Primary open angle glaucoma is distinctly a multifactorial optic neuropathy that is chronic and progressive with characteristic acquired loss of optic nerve fibers. **Aims:** Recognizing field defects and disk changes among the patients with primary angle glaucoma. **Settings and design:** A cross sectional study was conducted in the department of ophthalmology in Narayana Medical College and hospital, Nellore from the period of 2010 to 2012. **Materials and methods:** Detailed clinical history and evaluation was done for all the patients and noted in the case record form. Intraocular pressure was measured by Goldmann Applanation Tonometry. Gonioscopy was done by Goldmann Three mirror gonioscope. Disk evaluation was done by both direct ophthalmoscopy and slit lamp biomicroscopy using 78D and 90D lenses. Visual field examination by Humphreys automated field analyzer ii -i series standard white on white perimetry, SITA strategy. **Statistical analysis:** All the qualitative data was expressed in percentages and quantitative data was expressed in mean and standard deviation. **Results and conclusions:** The mean age of the study subjects was  $4.43 \pm 53.34$  years with male preponderance. The most common field defect found was bircuate scotoma. The most common disk change in the present study was advance cupping with total loss of NRR followed by Inferior NRR thinning and superior NRR thinning.

**Keywords:** POAG; Field defects; Glaucoma.

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### Introduction

Glaucoma is one of the leading causes of gradual onset blindness across the world. Primary open angle glaucoma is distinctly a multifactorial optic neuropathy that is chronic and progressive with characteristic acquired loss of optic nerve

fibers. Such loss develops in the presence of open anterior chamber angles, characteristic visual field abnormalities and Intraocular pressure that is too high for the continued health of eye. It manifests by cupping and atrophy of the optic disk in the absence of other known causes of glaucoma disease. Recognizing field defects and disc changes among the patients with primary angle glaucoma was the main objective of the present study.

### Materials and Methods

A cross-sectional study was conducted in the department of ophthalmology in Narayana Medical College and Hospital, Nellore from the period of 2010 to 2012. During the study period, 100 study subjects with primary angle glaucoma

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were included. Detailed clinical history and evaluation was done for all the patients and noted in the case record form. Intraocular pressure was measured by Goldmann Applanation Tonometry. Gonioscopy was done by Goldmann Three mirror gonioscope. Disc evaluation was done by both direct ophthalmoscopy and slit lamp bio microscopy using 78D and 90D lenses. Visual field examination by Humphreys automated field analyzer ii-i series standard white on white perimetry, SITA strategy. Visual acuity measured by the Snellen's visual charts. Refraction correction is given if needed.

**Statistical analysis:** All the data were entered in Microsoft Excel and analyzed using Epi info version 7.2. All the qualitative data were expressed in percentages and quantitative data were expressed in mean and standard deviation.

## Results

We included 100 study subjects in the present study.

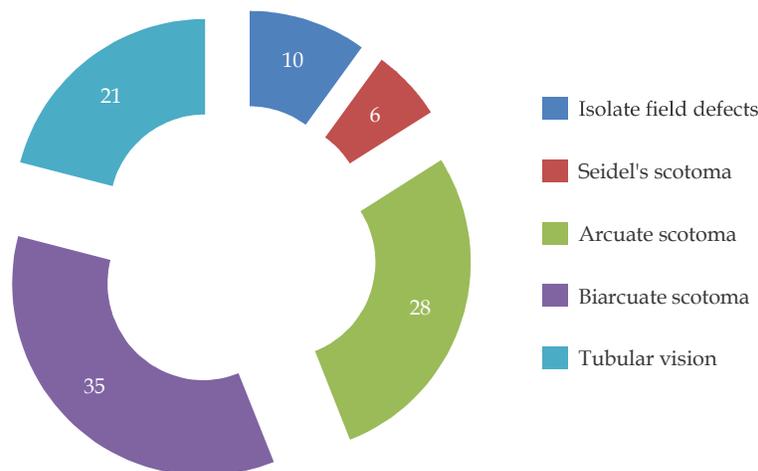
The mean age of the study subjects was  $53.34 \pm 4.43$  years with male preponderance.

**Table 1:** Demographic characteristics of the study sample

Demographic characteristics	Frequency	Percentage (%)
<b>Age group</b>		
<40	3	3
40 to 50	17	17
50 to 60	40	40
60 to 70	30	30
>70	10	10
<b>Gender</b>		
Male	62	62
Female	38	38

The most common field defect found was biarcuate scotoma (35%) followed by arcuate scotoma (28%) and tubular vision (21%) (Fig. 1).

The most common disk change in the present study was advance cupping with total loss of NRR (35%) followed by inferior NRR thinning (25%) and superior NRR thinning (15%) (Fig. 2).



**Fig. 1:** Prevalence of field defects in primary angle glaucoma.

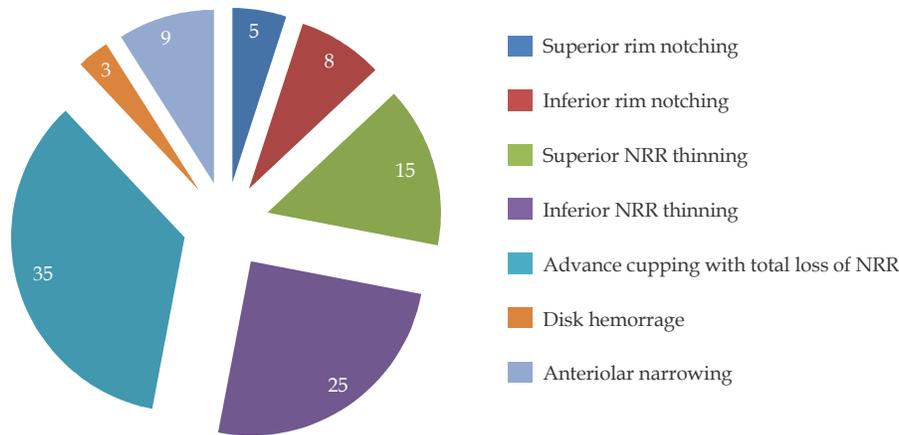


Fig. 2: Prevalence of different disk changes in primary open angle glaucoma.

## Discussion

The pattern of visual field loss in eyes with early damage is of particular interest because it may facilitate our understanding of the pathophysiology of glaucomatous optic nerve damage. Visual field assessment is mandatory for the diagnosis and management of primary open-angle glaucoma. With this background we conducted a study to understand the various field defects associated with primary open angle glaucoma and further study the disk changes in our patients. We included 100 subjects with primary open angle glaucoma attending our department with a mean age of  $53.34 \pm 4.43$  years and more than 50% of them were males. Studies conducted by Shreekanth B et al. Gizzard G et al. Alipanahi R et al. Agarwal HC et al. Tidake, P et al. Agarwal S et al. and Nangia V et al. corroborated with the present study findings.<sup>1-6</sup>

In the present study, the most common field defect found was biarcuate scotoma (35%) followed by arcuate scotoma (28%) and Tubular vision (21%). In a study conducted by Alipanahi R et al.<sup>3</sup> inferred that the peripheral scotoma beyond 20 of fixation and nasal step were the most common defect pattern in Tabriz center, and nasal and arcuate visual field defect in Graz. Yousefi S et al.<sup>7</sup> conducted the asymmetric patterns of visual field defects in primary open angle and closed angle glaucoma. In early POAG eyes, all of the TD points in the central region and a subset of TD points in the nasal, paracentral, and peripheral (arcuate 1) regions in superior hemifield were significantly worse than their counterparts in the inferior hemifield. In moderate POAG eyes, the TD points in all GHT regions were significantly worse than their counterparts in the inferior hemifield. In advanced POAG eyes, the TD values of all TD

points in all GHT regions were significantly worse than their counterparts in the inferior hemifield. Inferior visual field defects were more common as reported by the study conducted by Zeiter JH et al.<sup>8</sup>

Lee YH et al.<sup>9</sup> conducted a study to study the rate of visual field progression in primary open and closed angle glaucoma. The number of visual fields that satisfied the inclusion criteria for analysis was  $4.1 \pm 1.6$  in each patient in the POAG group. A total of 231 Goldmann visual fields were analyzed for the rate of visual field progression. In the POAG group, the visual field score was  $55.9 \pm 28.0$  at the initial visual field test and  $45.6 \pm 24.0$  at the final visual field test.

Agarwal HC et al.<sup>4</sup> inferred the visual field assessment in the patients with glaucoma. At presentation, Goldmann perimetry picked up 25 glaucomatous visual field defects in 23 eyes (6 nasal steps, 6 sector defects and 13 arcuate scotomas), which increased to 30 glaucomatous visual field defects in 26 eyes (7 nasal steps, 9 sector defects and 14 arcuate scotomas) by the end of the 9-month follow-up. HVF analyzer at presentation picked up 56 visual field defects in 44 eyes (19 in paracentral area, 15 in nasal step area, 5 sector defects and 17 in arcuate area) which increased to 69 visual field defects in 48 eyes (28 in paracentral area, 17 in nasal step area, 4 sector defects and 20 in arcuate area) by 9-month follow-up. The paracentral defect which was demonstrated on HVF analyzer could not be detected on Goldmann perimetry in the same eye at the same time.

## Conclusion

The fifth decade of life and being a male had higher prevalence of primary open angle glaucoma. The

most common field defect found was biarcuate scotoma. The most common disk change in the present study was advance cupping with total loss of NRR followed by inferior NRR thinning and superior NRR thinning. Frequent follow-ups for the changes in glaucoma is essential in the management of it.

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