

Hospital Based Prospective Evaluation of the Functional Visual Assessment, Pattern of Manifestation and Refractive Status of Angle Closure Glaucoma

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Conflict of interest: Nil

Abstract

Aim: Functional Visual Assessment, Pattern of Manifestation and Refractive Status of Angle Closure Glaucoma in Bihar region.

Methods: This prospective study was done in the department of Ophthalmology, Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga, Bihar, India for 1 year. The patients were informed about the study. For data collection consent was taken from them including their age, gender, occupation, educational qualification etc by face to face interview with the patient in the clinic. Primary Angle closure Glaucoma was defined as an intra ocular pressure of more than 35 mmHg or higher in presence of typical glaucomatous optic disc changes with close angle in Gonioscopy.

Result: Out of 100 respondent 44% were come with tubular field in right eye 19% were advanced field defect, 14% were superior field defect, 5% were inferior field defect, 9% were normal cupping and 9% were not possible due to poor vision. In the left eye out of 100 patients 32% were come with tubular field in the left eye at the clinic while 17% were advanced field defect 13% were normal cupping, 11% were superior field defect 11% were temporal island of vision, 8% were nasal step and 10% were not possible due to poor vision. Out of 100 patient 52% had tritan defect in right eye and 42% in left eye, 11% deutran defect in right eye and 17% in left eye, 2% protan defect in right and left eye, 4% only blue colour defect in right eye and 2% in left eye, 2% only yellow color defect in right eye and 9% in left eye, 21% normal color vision in right eye and 20% in left eye, rest are not possible due to poor vision. Among the study population the most frequent range of unaided contrast sensitivity in right eye was 0.5-1.00 log units and median was 0.81 log units, where the aided contrast sensitivity was 0-0.49 log units and the median was 0.60 which was statistically significant ($p > 0.00$, at 0.1 level).

Conclusion: Most of the PACG patient was associated with Hypermetropia. Most of them presented with advanced visual field defect, severe increased in IOP, advanced glaucomatous changes, poor contrast sensitivity and tritan color vision defect in both eyes. Identifying risk factors, early diagnosis, appropriate investigations and proper management in time could prevent the prognosis of the diseases.

Keywords: IOP, PACG, Hypermetropia

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Introduction

Glaucoma refers to a heterogeneous group of diseases whose common clinical denominator is an excavation of neuroretinal rim tissue located in the intrascleral portion of the optic nerve. The optic nerve is a white matter tract with intrascleral, retrobulbar, intracanalicular, and intracranial segments. Only the intrascleral portion of the optic nerve is available for direct clinical inspection. Glaucomatous changes in the intrascleral portion of the optic nerve were appreciated soon after Hermann von Helmholtz invented the ophthalmoscope in 1850 and these changes seemed intuitively related to elevated intraocular pressure (IOP). The typical course of chronic glaucoma progresses insidiously over decades. Unless glaucoma is associated with markedly elevated IOP, it is not associated with pain; furthermore, visual symptoms do not develop until the disease is advanced. For most patients the disease is insidious in onset with a long and poorly defined preclinical phase. Visual symptoms attributable to glaucomatous optic neuropathy, such as difficulty reading a menu in a dimly lit restaurant, usually signify advanced disease. This symptom relates to impaired contrast sensitivity, which depends on the integrity of the optic nerve and deteriorates as the disease progresses. Glaucoma classically does not affect central vision first, but even when it does, the seeing portion of the fellow eye covers for the affected eye, and most patients are oblivious of the change. [1] According to WHO about 4 crore people in the world are blind while 24 crore are suffering from low sight. [2] Those Glaucoma suspect people are usually out of glaucoma care due to lack of health care facilities and their lack of awareness results in development of advanced followed by blindness. In case of chronic angle closure glaucoma is often discovered incidentally during routine examination or during examination for another reason. ACG can also present with intermittent symptoms, change in

vision, or severe acute symptoms such as pain in the affected eye, headache, associated with nausea or vomiting. Patients who suspected of having ACG should be referred to ophthalmology care immediately.

Material and methods

This prospective study was done in the department of Ophthalmology, Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga, Bihar, India for 1 year.

Methodology

Patients with age of lower than 45 years and other ocular abnormalities like mature cataract, corneal edema, acute inflammation and infection in the eye, pathological conditions of the optic nerve other than glaucomatous changes and history of any ocular surgery other than cataract surgery were excluded from this study.

The Functional visual assessment, pattern of presentations and refractive status of Primary Angle closure Glaucoma patients, 100 subjects of over 45 years of age were examined. The patients were informed about the study.

For data collection consent was taken from them including their age, gender, occupation, educational qualification etc by face to face interview with the patient in the clinic. Primary Angle closure Glaucoma was defined as an intra ocular pressure of more than 35 mmHg or higher in presence of typical glaucomatous optic disc changes with close angle in Gonioscopy.

Result

The mean age of studied population was 53.6 and the standard deviation was 10.36. The study included 200 eyes of 100 primary angle closure glaucoma subjects. Among them 37% were males and 63% were females. Among 100 patient 65% family history was positive and 35% was negative. Among 100 patient

50% were using spectacle and 50% had no history. Maximum patient was using spectacle for near distance. 26% had medical history of systemic hypertension, 14% had diabetes, 13% had diabetes and hypertension 7% had asthma, 4% had cardiac problem of medical history and another 36% had no medical history.

Most Patients complaining of decrease vision at both near and distance where female are comparatively more affected where 26% were female 5% male and female percentage were same with the complain of headache. 5% were female and 2% were male with the complain of eye ache.

About 40% patients were presented with large cupping without thinning and notching, while

19% with bipolar notching, 17% inferior notching, 11% full cupping, 50 with superior and superior notching and 8% were not visible due to cataract or corneal haziness.

Maximum patient were come to the clinic with large cupping without thinning and notching (30%) while bipolar notching was 29%, 16% inferior notching, 11% full cupping, 50 were superior notching and 12% was not visible due to cataract or corneal haziness.

Out of 100 respondent 44% were come with tubular field in right eye 19% were advanced field defect, 14% were superior field defect, 5% were inferior field defect, 9% were normal cupping and 9% were not possible due to poor vision (Table 1).

Table 1: Status of field defect in right eye

Visual Field Defect	Percentage
Not possible due to poor vision	9%
Tubular Field	44%
Advanced Field Change	19%
Superior field defect	14%
Inferior field defect	5%
Normal cupping	9%
Total	100%

Status of Visual field defect in left eye: In the left eye out of 100 patients 32% were come with tubular field in the left eye at the clinic while 17% were advanced field defect 13% were normal cupping, 11% were

superior field defect 11% were temporal island of vision, 8% were nasal step and 10% were not possible due to poor vision (Table 2).

Table 2: Visual field defect in left eye

Visual Field Defect	Percentage
Not possible due to poor vision	9%
Tubular Field	32%
Advanced Field Change	17%
Superior field defect	11%
Temporal island of vision	10%
Normal cupping	13%
Nasal step	8%
Total	100%

Out of 100 patient 52% had tritan defect in right eye and 42% in left eye, 11% deutan

defect in right eye and 17% in left eye, 2% protan defect in right and left eye, 4% only

blue colour defect in right eye and 2% in left eye, 2% only yellow color defect in right eye and 9% in left eye, 21% normal color vision in right eye and 20% in left eye, rest are not possible due to poor vision.

40% patients came with tritan defect bilaterally at the clinic. 20% patients had deutan defect, 7.70% had only yellow color defect, 3.90% had only blue color defect. Color vision could not examine in 24.20% patients due to their poor vision.

Among the study population the most frequent range of unaided contrast sensitivity in right eye was 0.5-1.00 log units and median was 0.81 log units, where the aided contrast sensitivity was 0-0.49 log units and the median was 0.60 which was statistically significant ($p > 0.00$, at 0.1 level).

In left eye the most frequent range of aided contrast sensitivity was 0.50-1.00 log units and the median was 0.83 log units where the aided contrast sensitivity was also 0.50-1.00 log units and the median was 0.51 log units, which was statistically significant ($p < 0.001$). The most frequent range of unaided visual acuity in right eye was 0.30-0.50 log unit and the percentage were 46% where the aided visual acuity was 0.0-0.28 log unit and the percentage were 41%; which are statistically significant (p value=0.00). In the left eye the most frequent range of unaided visual acuity in left eye was also 0.30-0.50 log unit and the percentage were 46% and the aided visual acuity was 0.0 log unit in log Mar chart and the percentage was 41% which was strongly statistically significant ($p = 0.00$)

Discussion

Some authors reported that patient came with primary angle closure glaucoma in Chinese

ethnicity with a mean age of 69.8 years at enrollment. [2,3] In my study I found the mean age of study population was 53.6 year. [3] reported The study included 200 eyes of 100 primary angle closure glaucoma subjects.

Among them 37% were males and 63% were females.

Leske MC et al. reported that family history of glaucoma is the risk factor for PACG. In my study I found 65% family history was positive and 35% was negative which is not similar to the result. HM Von Romude et al. did an assumption that hyperemia would be a strong risk factor for PACG. But hyperopic was not statistically significantly more prevalent in PACG group than in the control group.

Since then several studies relationship between PACG and hyperopic was found in Indian urban area. The Beijing study found a relationship between hyperopic and anterior chamber angle, suggesting that hyperemia is a predominant risk factor. In my study I also found the evidence of increased risk of primary angle closure glaucoma among hyperopic was stronger in all subtypes of hyperopia among them 70% were hyperopes which is, more identical to that study. I didn't do any genetic analysis to find out correlation.

Ramanjit shihotaet al reported ACG occurred maximally in the sixth decade) in their study 269 patients were less than 50 years old and 54 were less than 40 years of age, which is in agreement with the study by. [4] But in my study, I found the mean age of the total population was 53.6. [4] documented that diminution of vision and ocular pain were common in PACG Than PAC and PACS. where Pain was the chief presenting complaint (62.1%) and sub acute groups (45.5%) But in my study I found most of the patient had diminution of vision at near and distance and history of acute pain and there percentage was 25% and 52% respectively.

Almost the angle closure subtypes, PACG was the most common seen in 402 patients ($n = 814$; 49.4%) followed by PAC in 323 patients (39.7%) and PACS in 93 patients (11%). In patients with different subtypes of angle closure in both eyes the eyes with the higher degree of angle closure was used for categorization. In my study I also found

PACG as a most common occurrence among all subtypes with 29% bilateral PACG and 71% were the rest. [3-12] some authors showed that more than 70% eyes had cup disc ratio greater than 0.8 while 54.9% had a cdr of 1, in my study I found 54% patients had cup disc ratio n was 0.9. Intra ocular pressure remains the most significant risk factor for the glaucomas and indeed the only one that can currently be modulated in my study I also found that maximum patients were present with high intraocular pressure ranges from 30-70 mmHg. 32% patients in my study were presented with tubular vision but the abnormality was not self-reported due to their lack of ideas about visual field defect. Another more significant finding of my study was the contrast sensitivity and color vision defect among the patient with PACG. 75% patient had tritan defect bilaterally that is exception of Kollner's rule. Among the study population the most frequent range of unaided contrast sensitivity in both eyes was 0.05-1.00 LOG UNIT, where the aided contrast sensitivity was also 0.5-1.00 LOG UNIT in left eye and was 0.49 in LOG UNIT in right eye. The most frequent range of unaided visual acuity in right eye in LOGMAR chart in this study was 0.3-0.8 log unit and the percentage was 51% and in left eye was 0.3-0.8 log unit and the percentage was 42%. The frequent range of visual acuity after spectacle correction in right eye was 0.0 log unit and left eye was 0.0 log unit which was strongly statistically significant ($p=0.00$). The most frequent range of unaided visual acuity in both eyes was N10-N12 and the aided near visual acuity was N6-N8 which was strongly statistically significant ($p=0.00$). [13-16]

Conclusion

Most of the PACG patient was associated with Hypermetropia. Most of them presented with advanced visual field defect, severe increased in IOP, advanced glaucomatous changes, poor contrast sensitivity and tritan color vision defect in both eyes. Identifying risk factors, early diagnosis, appropriate

investigations and proper management in time could prevent the prognosis of the diseases.

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