



ORIGINAL RESEARCH PAPER

Ophthalmology

NEW GLAUCOMA CASE DETECTION IN A SCREENING CAMP AT A TERTIARY OPHTHALMOLOGY CENTRE: A CROSS-SECTIONAL STUDY

KEY WORDS: Glaucoma screening, Primary angle closure glaucoma, Intraocular pressure, Applanation tonometry

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ABSTRACT

AIM: To estimate the proportion of incidence of glaucoma cases in a screening camp conducted at a tertiary Ophthalmology centre.
BACKGROUND: Glaucoma is the second leading cause of blindness in the adult population in India^{1,2}. The diagnosis of glaucoma was based on the presence of at least two of the following criteria: IOP ≥ 21 mmHg, glaucomatous optic disc abnormalities, and glaucomatous visual field defects.
MATERIALS AND METHODS: A prospective, cross sectional study was conducted on 100 consecutive individuals aged more than 40 years who came to our hospital Ophthalmology department from 08-March, 2020 to 14-March, 2020. All subjects underwent a comprehensive eye examination including brief history taking, slit lamp examination, applanation tonometry, gonioscopy, pachymetry, dilated fundus examination using slit lamp biomicroscopy with 90D lens and automated perimetry.
RESULTS: One hundred individuals including 43 males and 57 females are screened. The screening result found to be positive in 9 (9%) subjects who underwent further diagnostic evaluation which concluded 3 cases of Normotension glaucoma, 5 cases of Primary angle closure glaucoma and 1 individual with Secondary Glaucoma.
CONCLUSION: Periodical glaucoma screening helps to detect more number of glaucoma cases thereby preventing blindness. Routine glaucoma screening for individuals more than 40 years should be strictly followed by Ophthalmologists in the society.

INTRODUCTION

Glaucoma is a chronic, multifactorial optic neuropathy which causes characteristic optic nerve head changes and corresponding visual field defects with intraocular pressure as a modifiable risk factor. Glaucoma is the second most common cause of blindness worldwide. The number of people with glaucoma worldwide is expected to rise from 64 million to 76 million in 2020 and 111 million in 2040.

It is estimated that 4.5 million persons globally are blind due to glaucoma³. There are approximately 11.9 million persons aged 40 years and older with glaucoma in India⁴. In Tamilnadu, the prevalence of any type of glaucoma is 2.6%, Primary open angle glaucoma 1.7%, Primary angle-closure glaucoma 0.5%, Secondary glaucoma (excluding Pseudoexfoliation) 0.3%.⁵

Glaucoma broadly classified as Ocular hypertension or glaucoma suspect, Normotension glaucoma, Primary Open Angle glaucoma, Primary Angle Closure glaucoma, Secondary glaucoma and Congenital glaucoma. The rates of OHT have been reported from the VES⁶ APEDS⁵ and ACES⁷. The APEDS reported the lowest rate of Ocular hypertension 0.42%, 1.1% in ACES and 3.08% in VES.

Risk factors for glaucoma include age more than 40 years, positive family history, diabetes, hypertension, myopia, hypermetropia, long term steroid use, blunt trauma, multiple eye surgeries etc.

Clinical features may be asymptomatic, or redness, watering, ocular pain or significant visual field defect and vision loss. Medical management includes betablockers, alpha agonists, prostaglandin analogues, miotics and hyperosmolar agents, anti-oxidants like vitamin C and vitamin E. Now-a-days combined drugs give higher efficacy than individual drugs. Neuroprotective drugs include memantine, aminoguanidine, nifedipine, verapamil, brimonidine etc. Newer drugs like Rho-associated kinase (ROCK)inhibitors - ripasudil and netarsudil gaining popularity now-a-days.

When medical management fails, Laser Trabeculoplasty, Laser Iridotomy and surgical procedures like Trabeculectomy, Non-penetrating glaucoma filtration surgery, glaucoma shunt devices can be done.

Most types of glaucoma are asymptomatic, until the disease progresses and causes significant damage. Hence, screening is so critical, especially for high-risk individuals. In our study, we estimated the proportion of new cases of glaucoma in patients who attended a screening camp in our hospital.

MATERIALS AND METHODS:

A prospective, cross sectional study was conducted on 100 consecutive individuals aged more than 40 years who came to a tertiary care hospital Ophthalmology department from 08-March, 2020 to 14-March 2020. Patients included in this study are age more than 40 years, both male and female, history of diabetes, hypertension or both, history of topical steroid use for prolonged duration. Patients with known case of glaucoma and pre-existing ocular diseases like uveitis and other inflammatory conditions are excluded.

Brief history taking with priority to symptoms like redness, pain and watering of eyes, coloured halos, frequent change of presbyopic glasses, family history of glaucoma and history of steroid use noted. Visual acuity tested using Snellen's chart for distant vision and Jaeger's chart for near vision and refraction done. Colour vision tested by Ishihara chart.

Detailed ocular examination carried out using torch light, slit lamp examination, dilated fundus examination for optic disc evaluation using direct ophthalmoscopy, slit lamp biomicroscopy using 90 diopter (D) lens and indirect ophthalmoscopy. Intraocular pressure noted using applanation tonometry. Visual field was tested by automated perimetry using Humphrey field analyser with SITA-Fast strategy. Gonioscopy was carried out using Goldmann three mirror lens and findings noted. Anterior segment imaging and fundus photograph were taken for documentation purpose. Ultrasound pachymetry was done to measure central corneal

thickness. Also systemic investigations like blood pressure and blood sugar were done to rule out hypertension and diabetes.

RESULTS:

NUMBER OF GLAUCOMA CASES DETECTED:

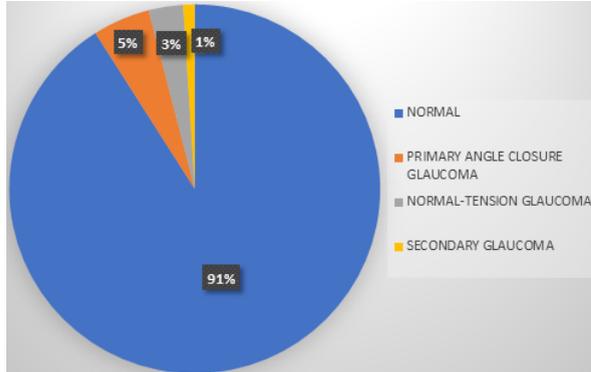


Figure 1: Distribution Of Various Types Of Glaucoma And Normal Individuals In Glaucoma Screening

In our study, out of 100 individuals screened, 91 individuals were normal (91%) and 9 glaucoma cases were detected (9%) namely 3 cases of normotension glaucoma, 5 cases of primary angle closure glaucoma and 1 case of secondary glaucoma (Neovascular glaucoma).

Table 1: Age Distribution Of Screened Individuals

AGE(years)	MALE	FEMALE	TOTAL
40 - 50	13	24	37
51 - 60	14	15	29
61 - 70	13	15	28
>70	3	3	6
TOTAL	43	57	100

Table 2: Age Distribution Of Glaucoma Cases Detected

Age distribution	No of Glaucoma cases detected	Percentage
40 - 49 years	5	55.6%
50 - 59 years	0	0
60 - 70 years	3	33.3%
>70 years	1	11.1%

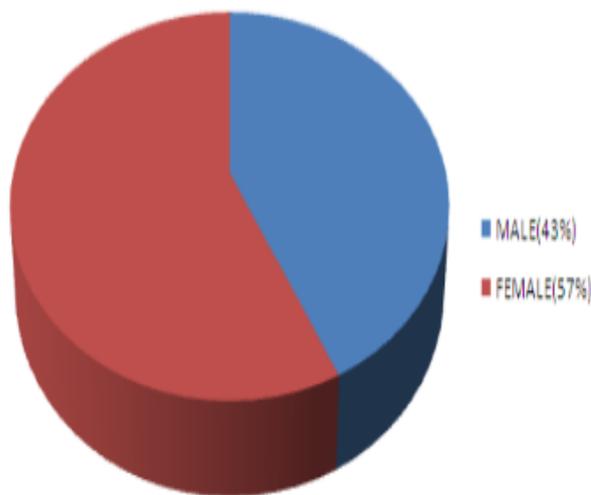


Figure 2: Sex Distribution Of 100 Screened Individuals

Out of 100 individuals screened, 43 were males and 57 were females. Maximum number of screened females (42.1%) belonged to the age group 40 - 45 years and maximum number of screened males (32.55%) belonged to 50 - 60 years. In our study, glaucoma was detected in 6 females and 3 males which showed female preponderance.

CASE DISTRIBUTION ASSOCIATED WITH REFRACTIVE ERROR

In our study, 27 were myopic, 19 were hypermetropic and 5 were emmetroic.

Table 3: Tabular Column Showing Various Types Of Glaucoma In Association With Various Refractive Status

Types of glaucoma	Myopia	Hypermetro pia	Emmetro pia
Normotension glaucoma	1	1	1
Primary Angle closure glaucoma	2	3	-
Secondary glaucoma (Open Angle)	-	1	-

Table 4: Tabular Column Showing Glaucoma Cases Distribution With Various Nature Of Lens

Type of lens	Immature cataract	Pseudopha kia	Aphak ia	Clear lens
Number of cases screened	49	7	2	44
No of glaucoma cases detected	2	2	0	5

In our study, more number of glaucoma cases were detected with clear lens individuals.

Table 5: Tabular Column Showing Central Corneal Thickness Of Patients Presented With Various Types Of Glaucoma

Type of glaucoma	Number of cases	Central corneal thickness (microns)
Normotension glaucoma	3	524
		535
		542
Primary angle closure glaucoma	5	435
		429
		440
		462
		454
Neovascular glaucoma	1	410

DISCUSSION:

In our study, out of 100 individuals screened, majority of cases 55.56% belonged to the age group 40 - 49 years followed by 33.3% in the age group 60 - 69 years and 11.1% found to be more than 70 years. Hence, routine glaucoma screening should be conducted for all individuals more than 40 years age to detect glaucoma at early stage and blindness can be prevented.

Also, 6 females and 3 males were diagnosed to have glaucoma which shows a sex predilection of 6% female and 3% male population indicating 2:1 ratio with female preponderance. As per the study by Cheng J.W. et al, female preponderance was identified, with a 1.5:1 female to male ratio found in Asians. Angle closure glaucoma is more common in Asia and much less common outside of Asia.⁷

In our study, which included screening of 100 individuals, 9 glaucoma cases were detected, out of which none of them had positive family history of glaucoma. According to the Glaucoma family study conducted by Becker, positive family history was reported in 13% to 25% of cases⁸.

In our study, out of 9 patients presented with glaucoma, 7 patients had complaints of watering and eyepain; 2 patients with defective vision. Among the defective vision individuals one person had neovascular glaucoma and another had primary angle closure glaucoma with immature cataract.

Gonioscopy revealed the grading of angle structures as per modified-Shaffer's grading. All 3 cases of normotension

glaucoma and one case of neovascular glaucoma were graded III to IV in all 4 quadrants of both eyes. All 5 cases of primary angle closure glaucoma were graded I to II in all 4 quadrants of both eyes.

As per Table 5, central corneal thickness (CCT) was found to be very low in neovascular glaucoma with 410 microns, 5 cases of primary angle closure glaucoma had CCT ranging from 429 microns to 462 microns while 3 cases of normotension glaucoma had normal CCT.

In our study, it was found that myopic individuals do not always have Primary open angle glaucoma. Out of three cases with myopia, two cases presented with Primary angle closure glaucoma and one case with normotension glaucoma. The highest prevalence of PACG is in Asia⁸. Our study revealed that Primary angle closure glaucoma cases are more in number.

When comparing the glaucoma cases presented with various nature of lens, it was found that out of 49 immature cataract cases, 2 glaucoma cases were detected; out of 7 pseudophakic individuals, 2 cases of glaucoma detected; out of 44 cases of clear lens individuals, 5 glaucoma cases detected and no glaucoma cases found in aphakic individuals.

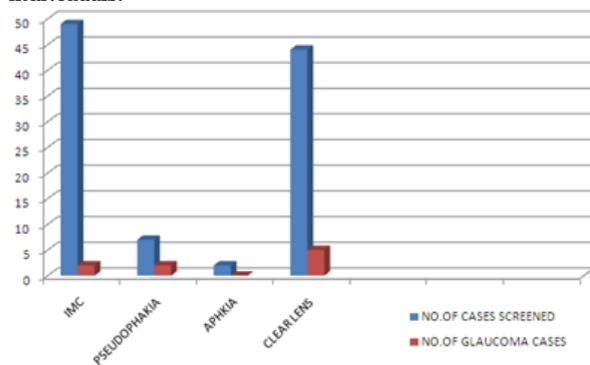


Figure 3: Bar Diagram Showing Number Of Glaucoma Cases With Corresponding To Nature Of Lens

In our study, all 3 cases of normotension glaucoma, 3 cases of Primary angle closure glaucoma, 1 case of neovascular glaucoma were treated medically and their intraocular pressure brought under control; 2 cases of Primary angle closure glaucoma were treated with Nd-YAG laser Peripheral Iridotomy.

LIMITATION OF STUDY:

More number of glaucoma cases might have been detected, if the sample size is still higher.

CONCLUSION

Routine glaucoma screening for individuals of age more than 40 years should be strictly followed by Ophthalmologists in the society. Also, any systemic disorder like diabetes, hypertension or coronary artery disease for prolonged duration reporting to concerned speciality has to attend eye clinic and they should participate in glaucoma screening so that the silent painless blinding disorder, glaucoma can be identified in society and earlier management can be started to control the progression of the disease.

DECLARATION OF INTEREST

The author declares that there is no conflict of interest.

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