

Prevalence of Glaucoma in Patients Above 40 Years of Age



Medical Science

KEYWORDS : Glaucoma, blindness, intraocular pressure, Prevalence, IOP

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ABSTRACT

Aim: To study the prevalence of glaucoma in patients aged 40 years of age and above and analyze the risk factors and associations for the same. Methodology: This is a randomized observational study conducted in outpatient department (OPD) of tertiary care hospital. Results: The prevalence of glaucoma was 13.27 % (13 out of 98), 6 had primary open angle glaucoma, 1 patient had angle closure glaucoma and 6 patients had secondary glaucoma. 8 were known cases of glaucoma and 5 patients were newly diagnosed. Increased prevalence of glaucoma with increasing age was observed (5 times more in age > 60 years). No association with sex, diabetes, hypertension and myopia was found. We also noted the increased risk of hypertensives developing ocular hypertension than the normal population. Conclusion: Patients above 40 years of age have increased prevalence of glaucoma. Hypertensives are found to have increased risk of developing glaucoma.

Introduction:

Glaucoma is a chronic progressive optic neuropathy caused by a group of ocular conditions which lead to damage of the optic nerve with loss of visual function. Glaucoma is the second leading cause of visual loss in the world next only to cataract⁽¹⁾. The most frequent causative risk factor for glaucomatous optic atrophy is elevated IOP⁽²⁾. But as of now, 3 parameters are considered for understanding of glaucoma: intraocular pressure, the optic nerve cupping and the visual field. Blindness due to glaucoma is irreversible. However, blindness due to glaucoma is preventable for which early detection and treatment is necessary. The aim of this randomized study is to study the prevalence of glaucoma in patients aged 40 years and above attending ophthalmic outpatient department.

Materials and methods:

Randomized observational study performed in outpatient department of tertiary care hospital. More than 40 years age patients are included in this study. Visual acuity, intraocular pressure, Visual field and fundus examination was done. Detailed history was elicited about their medical and ophthalmic problems. External examination and pupillary evaluation were performed with a flashlight. Slit lamp biomicroscopy was performed and peripheral anterior chamber depth was graded according to van Herick System⁽⁶⁾. Intraocular Pressure (IOP) was measured using a Schiotz indentation tonometer. The cornea of the patient was anaesthetized using lignocaine 4%. The IOP of each eye was recorded separately with 5.5gms weight. IOP was read from the table. Gonioscopy was performed on all patients in dim ambient illumination using Zeiss 4 mirror gonioscopes. The angle was graded according to Shaffer System⁽⁷⁾ (I-Narrow angle II-Potentially occludable angle III-open angle IV- wide open angle). All subjects with open angles on gonioscopy had pupillary dilatation with 1% tropicamide and 5% Phenylephrine. Grading of any lens opacification was noted at the slit lamp⁽⁸⁾. Evaluation of optic nerve head was performed using a direct ophthalmoscope. The cup: disc ratios were measured and recorded. The presence of any notching, splinter hemorrhages and peripapillary atrophy was noted. Fisher's exact test was performed to find the statistical association.

Diagnostic criteria:

A provisional diagnosis of glaucoma suspect was made when

the patient had any one of the following. IOP \geq 21 mmHg in either eye; C:D ratio (CDR) \geq 0.5 in either eye or CDR asymmetry \geq 0.2; and focal thinning, notching or a splinter hemorrhage; field defects on Bjerrum's tangent screen examination. A diagnosis of primary open angle glaucoma was made when any 2 of the above criteria were present in the patient with the angles open on gonioscopic examination. Paracentral scotomas (mild defect), arcuate scotomas (moderate defect), and tubular vision (severe defect) are considered as glaucomatous field defects. Ocular hypertension is diagnosed when a pressure $>$ 21 mmHg is alone present without field defects or fundus abnormalities. Blindness was defined as a best corrected visual acuity of $<$ 3/60 or a constriction of visual field $<$ 10 degrees from fixation in the better eye. Myopia was defined as a spherical equivalent more than -0.50 D in a phakic eye⁽⁹⁾. Diabetes mellitus was detected based on current use of anti-diabetes medication and / or random blood sugar level greater than 200mg/dl where available⁽¹⁰⁾. We defined systemic hypertension as the current use of systemic antihypertensive medication or a measured systolic blood pressure of \geq 140mm Hg and / or a diastolic blood pressure \geq 90mm Hg. Significance was assessed at the $P <$ 0.05 for all parameters.

Results:

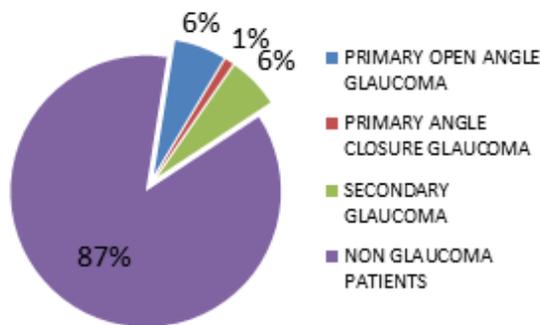


Figure 1: Prevalence of Glaucoma in study population

Glaucoma was diagnosed in 13 patients (13.27%) out of which there were 4 males (11.11%) and 9 females (14.52%). The average age at which glaucoma occurs was estimated to be 64.23 in

our study. 11(11.22%) Patients were found to be glaucoma suspects. There were 6 patients (6.12%) with Primary open angle glaucoma, 1 (1.02%) with Primary angle closure glaucoma and 6 (6.12%) with secondary glaucoma.

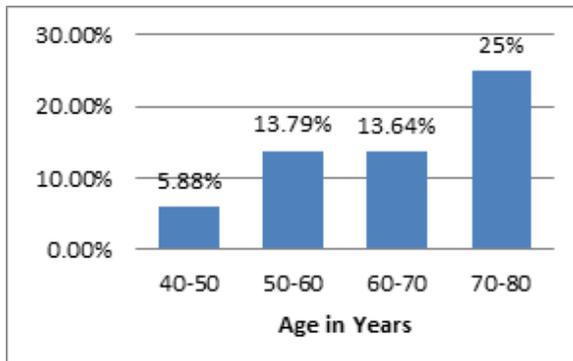
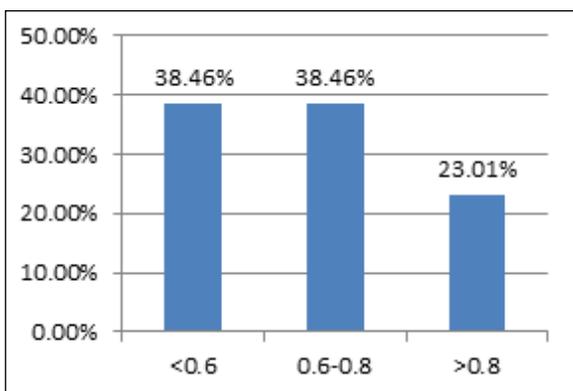


Figure 2: Distribution of Glaucoma diagnosed patients in age group

In our study, of the 28 diabetic patients,3 (10.71%) had glaucoma. Among the non diabetics,10 (14.29%) had glaucoma. Out of the 17 (17.35%) hypertensives,4 (23.53%) had glaucoma whereas among non hypertensives,9 (11.11%) were glaucoma patients. There were 5 (14.29%) glaucoma patients among myopes and 8 (12.70%) glaucoma patients among non myopes. With regard to associated systemic illness, 4 patients (30.77%) had hypertension, 3 patients (23.08%) had diabetes and 1 Patient (7.69%) had seizure. In our study, the most complaint reported by all 13 patients (100%) is defective vision 7 Patients (53.85%) complained pain and watering. 5 patients (38.46%) patients complained of headache and colored halos. Redness was complained by 4 Patients (30.77%). There were 2 (11.76%) ocular hypertensive patients out of 17 hypertensives and 1 (1.23%)ocular hypertensive among the non hypertensives.

Glaucomatous field changes were studied in all 13 patients.1 patient (7.69%) had mild field loss,5 (38.46%) had moderate field loss and 7 (53.85%) had severe field loss. 8 patients(61.54%) had IOP below 30 mmHg,2 (15.38%) had IOP between 30 and 50 mmHg and 3 (23.08%) had IOP above 50 mmHg.



Cup:Disc ratio

Figure 3: Distribution of Cup:Disc ratio in Glaucoma diagnosed patients

Patients with glaucoma in one eye was 5 (38.46%) out of 13 and 8 (61.54%) had glaucoma in both eyes. Comparing the visual field loss with duration of glaucoma,6 patients (75%) out of 8 with more than 1 year duration had tubular vision whereas in duration of less than 1 year only 1 (20%)out of 5 had tubular vision. When glaucomatous optic disc damage was assessed,1 patient(7.69%) had mild damage,5 (38.46%)had moderate damage

and 7 (53.85%) had advanced damage. In correlation of cup disc ratio and field, in patients with ratio less than 0.6, only 2 (40%) out of 5 had tubular vision. In patients with ratio between 0.6 and 0.8,2 patients (40%) out of 5 had tubular vision and in those with ratio more than 0.8,all 3 (100%) had tubular vision. As per the findings,8 (61.53%) among the 13 glaucoma patients were blind. Blindness in one eye was noted in 7 (53.84%) and that of both eyes was noted in 1 patient (7.69%).

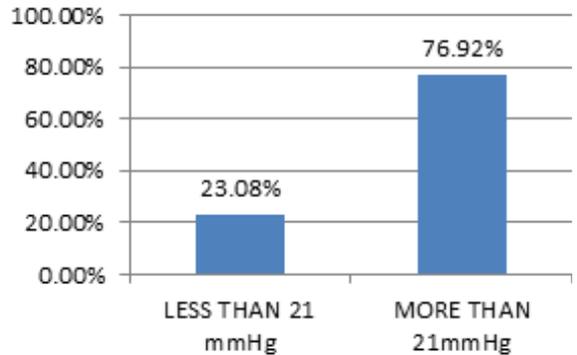


Figure 4: Distribution of IOP of the Glaucoma diagnosed patients

Among glaucoma, there were 10 patients (76.92%) with IOP > 21 mmHg and 3 (23.08%) < 21 mmHg. But in general population only 3(3.53%) had IOP >21 mmHg and 82(96.47%) had an IOP < 21mmHg.

Discussion:

As per the results, there's no gender predisposition to glaucoma. The reported prevalence of POAG in India is between 0.41% and 2.56% (3-5).The Vellore Eye Survey (VES)(3) reported a prevalence of 0.41% for POAG in 30 to 60 year age group. The Andhra Pradesh Eye Diseases Study (APEDS)(4) reported prevalence of POAG in urban population to be 2.56% in those aged more than 40 years. The prevalence of POAG in Aravind Comprehensive Eye Survey (ACES) (5) was 1.2%.The prevalence of POAG in our study is 6.12% .This is higher than the previous studies. This discrepancy may be due to them being population based studies and ours being a hospital based study. In our study there's no gender difference in POAG prevalence (4,12).

Prevalence of glaucoma increases with increasing age in our study. This is consistent with the results of previous studies (4,5,11,12) (Odd's ratio=4.69, p> 0.05). In our study diabetes mellitus, hypertension,(p=0.8)myopia or other systemic illness did not have any association with development of glaucoma(13-16). But ocular hypertensives were more among the hypertensive population in our study (p=0.07)(Odd's ratio=10.67).Hypertensives are at 10 times risk of developing ocular hypertension compared to normal population.

Most of the patients at presentation had an IOP less than 30 mmHg. But severe field losses were noted in patients who presented with IOP more than 30 mmHg. This justifies raised IOP as a most important risk factor in glaucoma (2).

Severe vision loss is noted with increase in duration of the disease. With poor compliance to medication the severe vision loss can set in earlier. In our study, with increasing cup disc ratio, the visual field loss also increases correspondingly. Thus, cup disc ratio is an important indicator for assessment of the glaucomatous damage to the eye and the disease progression. The existence of glaucoma as an increasing cause for blindness in our population is proved in our study also. This emphasizes the need for awareness on glaucoma.

Among the glaucoma patients, IOP was mostly > 21mmHg comparing to the normal population where it is only rarely elevated. (Odd's ratio=91, $p < 0.0001$, which is significant). Therefore, IOP elevation has strong association with development of glaucoma.

Conclusion:

Increased incidence of blindness due to glaucoma means that awareness of glaucoma as a cause of blindness is very low in the general population. Routine screening for glaucoma of all patients > 40 years who attend the ophthalmic OPD with complaints of defective vision is essential. All hypertensive patients attending ophthalmic OPD also need to be evaluated for glaucoma. Measurement of IOP, visual field testing and fundus examination is a must in ophthalmic OPD so that glaucoma is not missed. This will ensure the early detection of glaucoma. Counseling of all patients for health promotion in glaucoma will go a long way in preventing blindness due to glaucoma.

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