Original Research Article

A study to evaluate the Prevalence of Primary Open Angle Glaucoma in Patients with Myopia at tertiary care hospital

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Abstract

Background: Myopia is a condition of the eye that makes it difficult to see distant objects. **Aim:**The present study was conducted to assess prevalence of primary open angle glaucoma in patients with myopia. **Materials and Methods:** This cross- sectional study was conducted in outpatient Department of Ophthalmology, Sri Krishna Medical College and Hospital, Muzaffarpur. A total of 100 patients with myopia were included in the study. Prevalence of primary open angle glaucoma in patients with myopia was recorded. **Results:** In right eye, patients withIOP between 8-21 is 84%, > 21 is 16%. In left eye, patients with IOP between 8-21 is 85%, > 21 is 15%. In myopic patients, 15% of patients had POAG, 1% with ACG. **Conclusion:** Glaucoma, one of the leading causes of irreversible blindness in the adult population worldwide, is a progressive optic neuropathy. Primary open angle glaucoma (POAG) is the most commonly reported type of glaucoma in population based prevalence studies worldwide. Elevated intraocular pressure is a well-known major risk factor for POAG.

Keywords: Glaucoma,intraocular pressure,Primary open angle glaucoma.

Introduction

Myopia is a condition of the eye that makes it difficult to see objects that are far away without optical correction. Although myopia can be induced by lensor corneal curvature,or by other factors, axially elongated eyes represent a major portion of all myopia cases. Axial elongation can affect the intraocular structure, such as the optic discormacula,which are target sites for glaucomatous damage.Many studies have reported that myopiais a risk factor for glaucoma development. Large-scale population based studies have also reported that myopia is a risk factor for glaucoma development. [1,2]Primary open angle glaucoma(POAG)is a chronic progressive optic neuropathy. Direct and convincing evidences forprimary mechanisms of glaucoma are still lacking and early detection or predicting progression of POAG remains difficult and challenging.[3] Many studies have investigated and reported risk factors associated with glaucoma. Elevated intraocular pressure (IOP)is a well-known major risk factor for POAG. Evidence shows that lowering IOP reduces the risk of development or slows the progression of glaucoma. In addition, there is growing evidence that other risk factors like age, gender, race, refractive errors, heredity and systemic factors may play a role in glaucoma pathogenesis.[4]

Many studies found that high myopia has been associated with POAG.It is possible that myopic individuals may be at increased risk for the development of glaucoma.Epidemiologic evidence suggests that high myopia is a risk factor for the development and the progression of glaucomatous optic neuropathy.[5]Therefore, this study was conducted with an aim to evaluate the Prevalence of Primary Open Angle Glaucoma in Patients with Myopia.

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Materials and Methods

This prospective, unicentric, observational, cross-sectional study was conducted in outpatient Department of Ophthalmology, Sri Krishna Medical College and Hospital, Muzaffarpur. The study was approved by the institutional research and ethical committee. The study was conducted over a period from June 2019 to February 2021.An informed and written consent was taken from all the participating subjects prior to the commencement of the study. A total of 100 patients with myopia were included in the study. All patients diagnosed with myopic refractive error >3.00 diopter.A detailed physical examination and ophthalmological examination was done.

During Ophthalmological examination,best corrected visual acuity (BCVA) was assessed using an illuminattx1Snellen's chart, with the patient seated at 6 meters distance.Near vision was assessed, using Jaeger's near vision chart.Colour vision was checked using Ishihara's pseudo-isochromatic charts. BCVA was checked by Skiascopy or streak retinoscopy. Slit lamp examination was performed to rule out anterior segment pathology.

Gonioscopy was done with Goldmann's three mirror gonio lens and the anterior chamber angle was graded according to modified Shaffer's grading.Dilated fundus examination by indirect ophthalmoscopy ,followed by a slit lamp biomicroscopic evaluation with 78 D lens and 90 D lens to evaluate the posterior pole including the optic disc was done.

Visual field was tested using the Automated Humphrey Visual Field Analyzer. The test algorithm used was SITA standard 30-2. The visual fields were analyzed as per the Anderrson Patella criteriaand the severity of the glaucomatous field changes were graded according to

the Hodapp,Parrish and Andersson classification guidelines given in the European Glaucoma Society guidelines for Glaucoma,3a Edition.Patients are analyzed for some parameters such as C:D ratio, 10P, visual fields, each eye was analyzed separately as there could be differences between the two eyes of the same patient which would be missed if both eyes were evaluated together. Data are presented as mean and standard deviation for continuous variables. Statistical significance was considered when P was <0.05.

Table1:Distributionof patients

Total-100		
Gender	**Males**	**Females**
Number	51	49

Table 2 shows the Best corrected visual acuity in Right Eye.

Table 2:Best corrected visual acuity in RE.

BCVA	MYOPIA	
	Count	%
PL+ve	0	0.0
HM+	1	1.0
CF1m	2	2.0
CF2m	1	1.0
CF3m	1	1.0
3/60	2	2.0
6/60	4	4.0
6/36	2	2.0
6/24	2	2.0
6/12	3	3.0
6/9	25	25.0
6/6	57	57.0
Total	100	100.0

The Best corrected visual acuityLeft Eye is shown in Table-3.

Table 3:Best corrected visual acuity LE

BC VALE	MYOPIA	
	Count	%
HM+	2	2.0
CF3m	2	2.0
1/60	1	1.0
3/60	2	2.0
6/60	3	3.0
6/36	3	3.0
6/24	1	1.0
6/18	1	1.0
6/12	0	0.0
6/9	22	22.0
6/6	63	63.0
Total	100	100.0

Table 4:IOP variation in RE& LE.

Eye	IOP 8-21	IOP>21
LE	85	84
RE	15	16

Table-4 shows that in right eye,patients with IOP between 8-21 is 84%,>21 is 16%. In left eye, patients with IOP between 8-21 is 85%,>21is15%.

Table 5:Prevalence of POAG

Classification	MYOPIA	
	Count	%
	84	84.0
ACG	1	1.0
POAG	15	15.0
Total	100	100.0

Table-5 shows that in myopic patients,15% of patients had POAG, 1%withACG.

Discussion

The World Health Organization has estimated that 8.9 million people in India are blind, of which 12.8% are due to glaucoma. The visual disability and irreversible blindness from glaucoma has significant socio- economic impact andtheproblem is expected to reach alarming proportions in few years. Risk for blindness from Primary Open Angle Glaucoma is high because of advanced stage at the time of diagnosis,onset of glaucoma at young age,inadequate intraocular pressure control, high rate of progression despite treatment, undiagnosed glaucoma and missed opportunities for diagnosing glaucoma.[6]Screening for glaucoma in the population will help to identify casesearly.However it may be economically unviable to screen the entire population. Identification of the risk factors will help to select high risk patients for screening which in turn should lead to an overall reduction in the blindness due to this disease and the morbidity associated with it.[7]Available data suggests that the prevalence of POAG varies from race to race and is influenced by various factors like age,gender, and other associated risk factors.The prevalence of POAG among adult black populations is much higher than the prevalence in predominately white adult populations which ranges from 1.1to3%.The prevalence estimated for POAG,in East Asia varies from 0.5 to 2.3% and from India is between 0.41% to 2.56%.[8]Our study is a hospital based study. It was performed to calculate the prevalence of POAG in patients with myopia,100 myopic patients were included.Population based studies done in rural 180 and urban South India 82'83 and in Central India also did not show any significant gender variation between patients with or without POAG. The blue mountain eye disease study showed a higher incidence of POAG in women than in men13, where the odds ratio of females having POAG was 1.3 (95% Cl, 0.7, 2.6), although this was not statistically significant.The study done by Faschinger et al,[8] in Barbados which showed that males were more likely to have POAG.

In our study 15% of myopic(>3D to 6D)population between the age group 20-40 years developed POAG ($p<0.05$). The Blue Mountain study 57 which is a population based cross sectional study showed glaucoma was present in 4.2% of eyes with low myopia (> or =-1.00 D to < -3.0D) and 4.4% of eyes with moderate to high myopia (> or = -3.0D) as compared to 1.5% of eyes without myopia. This study concluded that Myopic subjects had a twofold to threefold increased risk of glaucoma compared with that of nonmyopic subjects.The risk was independentofother glaucoma risk factors and IOP.Our results were in similar to Aravind study,[9] which showed myopia had a statistically significant association with POAG. Myopic subjects had a two fold or threefold increased risk of glaucoma compared with that of nonmyopic subjects. Population based study by Chang RT,[10] did not show any association between myopia and POAG. The Limitation of this study is that it is a hospital based cross- sectional study as compared to the other related studies which have been done which were mainly population based epidemiological studies. Another drawback is the small sample size as compared to many of the other studies.

Conclusion

Glaucoma,one of the leading causes of irreversible blindness in the adult population worldwide, is a progressive optic neuropathy. Primary open angle glaucoma(POAG) is the most commonly reported type of glaucoma in population based prevalence studies worldwide. Elevated intraocular pressure is a well-known major risk factor for POAG.

Results

The present study was conducted to evaluate the Prevalence of Primary Open Angle Glaucoma in Patients with Myopia. The gender wise distribution of the subjects is shown in table-1. This shows that out of 100, males were 51 and females were49.

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