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AN EPIDEMIOLOGICAL STUDY OF GLAUCOMA IN A TERTIARY CARE TEACHING HOSPITAL OF EASTERN UTTAR PRADESH

Ophthalmology

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ABSTRACT

Background: Glaucoma is a disease that causes progressive damages to optic nerve. It is characterized by increased fluid build up in the front part of eye which thereby causes increase pressure in eye and damage of the optic nerve.

Aim of the Study: To study the prevalence of glaucoma among patients attending the ophthalmology out-patient facility in a tertiary care teaching hospital of Eastern Uttar Pradesh.

Material and Methods: The study was conducted from July 2018 to December 2018 among the patients attending ophthalmology out-patient facility at Hind Institute of Medical Sciences, Safedabad, Barabanki. A total 11324 patients were screened for glaucoma. All subjects underwent a detailed ophthalmic examination including slit lamp examination, applanation tonometry, gonioscopy with 2 mirror lens, dilated fundus examination with +90 D lens and visual field examination by using HFA (30-2) program. Glaucoma was defined using modified International Society of Geographical and Epidemiological Ophthalmology criteria.

Results: The overall proportion of glaucoma among the patients attending ophthalmology out-patient facility was found to be 3.7%. Among these 31.4% were primary angle closure disease (PAC) while 60.5%were primary open angle glaucoma (POAG). Also, 7.9% were of secondary glaucoma. Out of the cases of primary angle closure disease, 51.4% were cases of angle closure glaucoma (ACG). Family history was positive in 40 patients, with 28 of all diagnosed patients were diabetics and 23 were hypertensive.

Conclusions: Glaucoma is one of the leading cause of blindness in the world. Since it leads to irreversible blindness, early diagnosis is of utmost importance. Strategies to increase public awareness and periodic eye examinations are key to reduce the problem.

KEYWORDS

Angle closure disease (ACD), angle closure glaucoma (ACG), Primary open angle glaucoma (POAG)

INTRODUCTION

Glaucoma is a chronic progressive optic neuropathy which is characterized by typical optic disc and retinal nerve fibre layer changes with corresponding visual field defect wherein intraocular pressure is a major risk factor.[1] Glaucoma, the leading cause of global irreversible blindness, is estimated to have affected over 60.5 million persons worldwide.[2]

It is estimated that there are more than 60 million cases glaucoma worldwide and it will increase to 80 million by 2020.[3] The estimated prevalence for India was 11.9 million in a study conducted in the late 1990s; the number has only increased since.[4,5] Glaucoma is the third leading cause of blindness in India.[6]

India has concentrated on detection of primary open-angle glaucoma but it has been found that in oriental races including India, primary angle closure glaucoma accounts for nearly 30% of all cases of glaucoma.[7,8] About half the glaucoma patients in a community remain undiagnosed worldwide and in our country this figure is around 90%. On the other hand, nearly half of the "glaucoma patients" using ocular hypotensive medication do not need the medications or are over-treated. Under-diagnosis of glaucoma is either a result of patients not presenting to their ophthalmologist or ophthalmologist missing the diagnosis. Also most of the cases patient not aware of their own risk for glaucoma; in other cases, some patients do not have access to primary eye care because of insufficient financial resources.[9] Therefore, the present epidemiological study was done because there is lack of such research works in eastern Uttar Pradesh. The study was carried out to assess prevalence of glaucoma among patients attending the ophthalmology out-patient facility in a tertiary care teaching hospital of Eastern Uttar Pradesh.

MATERIALS AND METHODS

Study Design: Hospital based study.

Study settings: The study was conducted in the Department of Ophthalmology, Hind Institute of Medical Sciences, Barabanki.

Study Population: All the patients attending out-patient facility of department of Ophthalmology, Hind Institute of Medical Sciences, Barabanki.

Study Duration: July 2018 –December 2018

Sampling Technique: Complete enumeration process was used. All the patients attending out-patient facility of department of Ophthalmology fulfilling the inclusion criteria during the time frame of study were enrolled in the study after obtaining written informed consent. A total 11324 study subjects were enrolled.

Data collection tool: A well-structured organised questionnaire was prepared to collect information on the socio-demographic characteristics of the participants. Risk factors were assessed for family history, diabetes and hypertension.

Screening for Glaucoma:

They were screened for glaucoma by doing slit lamp examination, applanation tonometry, gonioscopy with 2 mirror lens, dilated fundus examination with +90 D lens and visual field examination by using HFA(30-2) program. Glaucoma was defined based on International society of geographical and epidemiologic ophthalmology (ISGEO) classification.[10] Patients were classified into open angle and closed angle based on gonioscopy utilizing Schaffer's grading of angle.

Data Analysis: Data collected was initially entered in Microsoft Excel and then transferred Epi-Info software for final analysis after data cleaning and sorting. Descriptive data was summarised by the means of frequency and percentages with 95% confidence interval (CI).

RESULTS

The overall proportion of glaucoma among the patients attending ophthalmology out-patient facility was found to be 3.7% (426 out of 11324) diagnosed during screening. Thus the overall hospital based prevalence of glaucoma was 37 per 1000 population. Out of these 258 cases were of POAG (60.6%), 134 of PAC disease (31.5) and 34 cases (7.9%) were of secondary glaucoma (Fig no. 1).

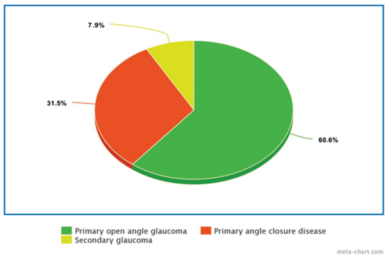

Fig no. 1 Distribution of patients on the basis of type of glaucoma

Out of 34 patient of secondary glaucoma, 25 were of LIG (73.5%), 2 of uveitis glaucoma (5.8%), 2 of PXF Glaucoma (5.8%), 2 of pigmentary glaucoma (5.8%) and 1 each of traumatic, NVG, aphakic glaucoma (2.9%) (Fig no. 2).

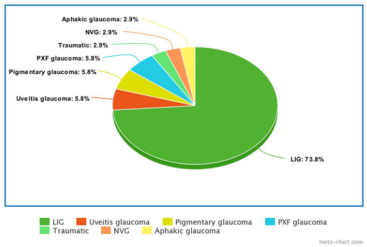

Fig no. 2 Distribution of secondary glaucoma patients

About 69 patients out of 134 patients of primary angle closure disease were case of ACG (Angle closure glaucoma). Overall male to female distribution was 267 male cases to 159 female cases (Table no. 1).

Table no. 1: Age and sex-wise distribution in glaucoma patient

Age (years)	Gender-wise distribution		Total
	Male	Female	
40-50	67 (46.5)	77 (53.4)	144
51-60	88 (70.9)	36 (29.1)	124
61-70	81 (66.3)	41 (33.6)	122
71-80	22 (81.4)	5 (18.5)	27
>80	9 (100.0)	0 (0.0)	9
Total	267 (62.6)	156 (26.2)	426

About 184 males and 74 females were diagnosed as POAG. Almost 58 male and 76 females were suffering from primary angle closure disease, among them 37 male and 32 females were suffering from angle closure glaucoma (Fig no. 3).

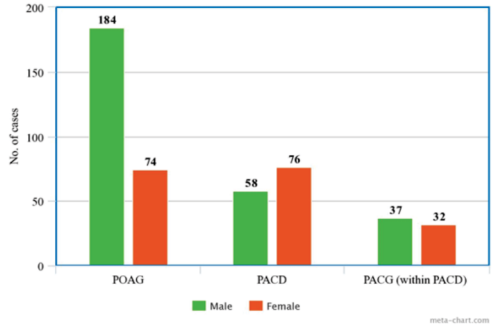

Fig no. 3 Gender-wise distribution of glaucoma cases

As with more chronic diseases, the prevalence of disease increases with increasing age. Risk of the disease increases in more than 50 years than 40-50 years (Table no. 2)

34 cases were of secondary glaucoma

Table no 2: Age-wise distribution in types of primary glaucoma

Age (years)	Primary open angle glaucoma (POAG)	Primary angle closure (PACD)	Total
40-50	68 (49.2)	70 (50.7)	138
51-60	84 (70.5)	35 (29.4)	119
61-70	83 (75.4)	27 (24.5)	110
71-80	18 (90.0)	2 (10.0)	20
>80	5 (100.0)	0 (0.0)	5
Total	258 (65.8)	134 (34.1)	392

Among 426 patients of glaucoma 40 patients (9.38%) had positive family history, 28 patients (6.57%) having diabetes, 23 patients (5.39%) were having hypertension (Fig no. 4 and Table).

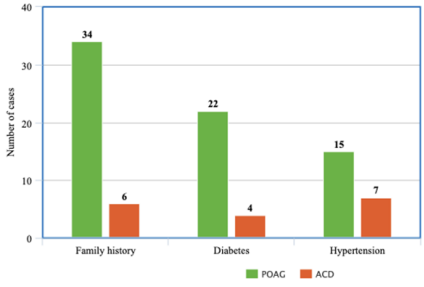

Fig no. 4 Associated risk factors with type of glaucoma

Table no. 3: Association of Risk factor and types of glaucoma

Presence of risk factor	Primary open angle glaucoma (POAG)	Primary angle closure (PACD)	Total
Family history	34 (85.0)	6 (6.4)	40
Diabetes	22 (78.5)	4 (14.2)	28
Hypertension	15 (65.2)	7 (7.2)	23

DISCUSSION

Estimated global prevalence of glaucoma was found to be 3.54% in a systemic meta-analysis in 2014 with the highest prevalence in Africa.[11] In India estimated number of cases of glaucoma is twelve million, about one fifth of global burden of glaucoma. In Indian population an equal proportion of open angle and closed angle glaucoma is seen.[12]

The prevalence of POAG in rural south Indians aged 40 years and above was estimated as 1.7% in ACES study.[13] Over the last decade, prevalence of glaucoma has been reported by Vellore Eye survey, Andhra Pradesh eye disease Study, Aravind Comprehensive Eye Survey, Chennai Glaucoma study and West Bengal Glaucoma study.[13-17] Sample size was comparable with other glaucoma study world-wide;[11-19] however they have some differences because of methodological variations and study settings. Prevalence was comparatively higher in the urban south India Chennai Glaucoma Study (3.5%).[20]

In our study overall prevalence of glaucoma was 37.6 cases per 1000 population. There are large differences in data due to under diagnosis of glaucoma in semi urban population due to lack of publicity. Knowledge among people and lack of trained staff to make diagnosis. Our study shows higher prevalence of glaucoma in males. The Aravind Comprehensive Eye Survey, Barbados Eye Study, Rotterdam study and Framingham Eye study also showed higher prevalence of glaucoma in males.[13,18,19,21] Beaver Dam eye study showed no gender difference in glaucoma prevalence;[20] however CGS and Central India Eye and medical study (CEMS) also showed no difference in glaucoma prevalence rates between genders.[20,21] Blue mountain eye studyreported a higher prevalence of glaucoma in female.[22]

Several studies have shown that prevalence of glaucoma increases as the age advances.[13]

Our study also showed similar pattern, CGS also found similar results with subjects over >70 years having more POAG than those with younger than 50 years.[22] In our study patient were 40 years and above with mean age of a diagnosed patient 56 years and on average 58.3 years for open angle and 52.7 years for closed angle glaucoma patients.

Table 4: Systematic review and comparison of glaucoma prevalence with previous studies (%)

Studies	POAG	PACG
Vellore Eye study(VES)	4.1	4.32
Andhra Pradesh eye disease study(APEDS)	2.56	1.08
Aravind comprehensive eye survey(ACES)	1.7	0.5
Chennai glaucoma study(CGS)	Rural 1.62	Rural 0.87
	Urban 3.51	Urban 0.88
West Bengal glaucoma study(WBGS)	2.99	0.24
Our study	**2.27**	**0.61**

CONCLUSION

Initiatives to increase public awareness by using proper media and enhancing comprehensive eye examination by ophthalmologist by using basic slit lamp examinations, IOP measurement, pachymetry, gonioscopy, dilated fundus examination and visual field examination. By using all this we can definitely minimise the prevalence of glaucoma.

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