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Study of Importance of Family Screening in Glaucoma

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INTRODUCTION

Glaucoma is the leading cause of irreversible blindness worldwide and in India.It has been estimated that nearly 12 million Indians currently have glaucoma and this figure will increase to more than 16 million by the year 2020.[1] Population based studies in India suggest that more than 90% of glaucoma cases in India remain undiagnosed.[2,3] These high rates of undiagnosed glaucoma translate into significant rates of glaucoma blindness. The World Glaucoma Association has set a goal of reducing the undiagnosed rate of glaucoma from 50% to no more than 20% by 2020.

Since visual loss from glaucoma is preventable if detected and treated early, it is imperative to have population screening. The multiple factors responsible for glaucoma, the multiple tests used to diagnose glaucoma and the low prevalence demand targeted screening of high risk subgroups. The increased risk of glaucoma in family members of persons with glaucoma has been well recognized.Epidemiologic data from the Baltimore Eye Survey[4] confirm that family history of glaucoma is an important risk factor. Cross sectional studies seem to suggest close to 50% of all glaucomas to be familial and a positive family history confers threefold increase in risk of developing open angle glaucoma.[4,5]

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AIM

To describe the value and results of opportunistic family screening of glaucoma patients in the glaucoma clinic of a tertiary eye hospital.

MATERIALS & METHODS

This cross sectional study recruited probands of primary open angle glaucoma and primary angle closure glaucoma diagnosed at the glaucoma services between April 2020 and May 2022 and their families who were invited to participate in the screening program after obtaining an informed consent from the probands. The family study was approved by the Institutional Review Board and Ethics Committee of the concerned hospitals and was conducted in accordance with the relevant declaration of Helsinki specifications.

All consecutive persons with newly diagnosed primary glaucoma in the study period were explained about the glaucoma family screening initiative by a study coordinator and requested to provide the name, age, sex, nature of relationship and mailing address of their first degree relatives. An informed consent was obtained from all probands to contact their first degree relatives to invite them to participate in the screening to detect glaucoma.

The subjects underwent a comprehensive ophthalmic examination and glaucoma examination including IOP measurement by Goldman applanation tonometry ,binocular dilated fundoscopy with +90D Volk lens, gonioscopy using the 4 mirror Volk goniolens and achromatic perimetry using the HFA(Humphrey Visual Field analyser Carl Zeiss Meditec Model 7201, Dublin)SITA 24-2 strategy.We included for analysis only the family members who

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were subject to a complete ophthalmologic evaluation by the study team to confirm or exclude glaucoma. The family members were divided as Type I (Parents/children) or Type II (siblings).

Statistical analysis was done by statistical software STATA 11.0. Chi-square test, independent t-test and paired t-test used. P-value less than 0.05 considered as statistically significant.

RESULTS

Of the 300 persons detected with primary glaucoma whose families were invited to participate in the family screening initiative, there were 114 first degree relatives from 54 families who attended the screening with a response rate of 32%. The relatives of probands ranged in age from 18 to 89 years (Mean 54.85 ± 10.2 years) with 56.8% being males. Out of 114 subjects screened; 235 were diagnosed as primary angle closure suspects,8 as angle closure,238 as glaucoma suspects and 132 subjects(11.6%) had definite glaucoma. Most affected subjects were in 40-70 yrs. Angle closure disease was found more in females. Also, better review follow up of the primary patient and family members was noted (95%).

Glaucoma	**Relatives**		**Total (n=1141)**
	Type I	Type II	
Open Angle glaucoma	4.73%(54)	6.5%(74)	128
Angle Closure glaucoma	0.1%(1)	0.3%(3)	4
Angle closure suspect/disease	6.7%(76)	14.6%(167)	243
Glaucoma suspect	9%(103)	11.8%(135)	238
Normal	26.8%(306)	19.45%(222)	528

Table1.Distribution of glaucoma in family members

DISCUSSION & CONCLUSIONS

Prior studies[4,6,7] have indicated that primary open angle glaucoma is more likely to affect persons with a family history of the disease and a positive family history has been assumed to be associated with a significant risk of glaucoma. The Rotterdam eye study[8] had reported 10% prevalence of glaucoma in siblings as against 1.1% in off-springs of persons with glaucoma. Nguyen et al[9] had also reported that siblings among the first degree relatives have the highest risk of glaucoma. In the Aravind Eye Hospital study[10], it was found that siblings of Indian patients with angle closure have a substantially higher risk of angle closure as compared to siblings of individuals with open angles. Roughly one in four siblings of Indian angle closure patients was found to have t angle closure.

Our study also found higher prevalence of glaucoma in siblings; especially angle closure entity.We found a higher prevalence of definite glaucoma in this cohort than in a general population. Very few published Indian study are available on family screening of glaucoma. No published Indian study is known to the author with a sample size as large as this study. Targeting first degree relatives of persons with primary glaucoma may offer a relatively inexpensive way of detecting glaucoma and in the identification of suspects at risk of glaucoma who may be advocated closer monitoring. Additionally, screening at- risk population benefits in terms of glaucoma awareness,better follow-up and also increase in outpatient clinic volume.

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