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Glaucoma suspect & humphery field analyzer a correlation

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Abstract

Glaucoma originally meant "clouded", in Greek. The term glaucoma refers to a group of diseases that have in common characteristic optic neuropathy with associated visual field loss for which elevated intraocular pressure is one of the primary risk factor. The purpose of the study is to correlate the clinically diagnosed cases of glaucoma suspect with the Humphrey Field Analyzer (HFA). Fifty cases of glaucoma suspect who attended the glaucoma clinic of Nepal Eye Hospital Tripureswor, Kathmandu, Nepal and who meets at least two criteria, among the four types of glaucoma suspects were advised for the HFA for the study. In this study out of 50 patient, 36 (72%) patients had normal visual field. 14 (28%) patients had thinning of the neural retinal rim (NRR) in both eyes. The significant relation with thinning of neural retina rim and glaucomatous hemifield test was found in the study.

Key words: Glaucoma suspect, glaucomatous hemifield test, humphrey field analyzer, neuroretinal rim.

Introduction

Glaucoma originally meant "clouded", in Greek[1]. The term glaucoma refers to a group of diseases that have in common characteristic optic neuropathy with associated visual field loss for which elevated intraocular pressure is one of the primary risk factor.[2] Glaucoma is the second leading cause of blindness. The normal accepted intraocular pressure is 10-21mm of Hg.[2]

There are an estimated 45 million blind people and 135 million visually impaired people worldwide.[3] The global prevalence of childhood blindness is thought to be around 0.07%, or approximately one tenth of the prevalence of blindness in adults.[4] The prevalence of bilateral blindness in developing countries in Asia ranges from 0.3% of 4.4%[5] in the year 2000, an estimated 66.8 million people had glaucoma, due to which 6.7 million people suffered bilateral blindness in developed countries, less than half of those who have glaucoma are aware that they have the disease, and in developing countries this figure is even lower.[6] In the coming years, it is estimated that there will be 60.5 million people with POAG (primary open angle glaucoma)and ACG (angle closure glaucoma) in 2010 and of these, 74% will have OAG (open angle glaucoma). Women will comprise 55% of OAG, 70% of ACG, & 59% of all glaucoma in 2010.). Asian will represent 47% of those

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with glaucoma and 87% of those with ACG.).Bilateral blindness will be present in 4.5 million people with OAG and 3.9 million people with ACG in 2010 and can lead to second cause of blindness worldwide. With proper improved screening methods, early detection and intervention can be carried out. So to prevent this, improved methods of screening and early intervention are required. [7]

Materials and methods

(This was) a prospective hospital based-study, which was conducted in Nepal Eye Hospital from 1st June 2007 to 30th May 2008 of the patient attending glaucoma clinic .Cases of glaucoma suspect were taken for the study. Among the four types of glaucoma suspects, the patients who meet at least two or more than two criteria of glaucoma suspect were enrolled in the study. Although Becker & Shaffer have included glaucoma suspect as those having any one criteria in all the four types of glaucoma suspects, we had taken two criteria as a prerequisite. It is because if those patients with only one criteria were subjected to do Humphrey field testing, unnecessary money would have been spent provided the field comes out to be normal. This prevents the economical burden of the patients. The sample size was 50patients.

The detailed history of the patient was taken, which included name, age, sex, address race and occupation of the patient. Symptoms of the patient like headache, colored halos, diminution of vision, history of using glass, history of ocular diseases like myopia, retinitis pigmentosa were taken. Systemic diseases like diabetes, hypertension, thyroid disorders, history of using any topical or systemic drugs, history of any ocular surgery or trauma and family history were taken. Patient visual acuity with naked eyes and pinhole or glass was recorded. Extra ocular movements were checked. Detailed examination of the patient on slit lamp was done. Intraocular pressure were taken by applanation tonometry. Anterior segment examination like corneal edema, scar, pigmentation, degeneration/ dystrophy, anterior chamber depth is graded according to Van Herrick method (reference). Iris color and pattern were noted. Rubeosis if present was noted. Pupil direct and consensual reflex were noted. Lens cataract or not vitreous condition were noted. Posterior segment examination were done with 90D lens. Cup disc ratio, notch, neuroretinalrim, peripapillary atrophy recorded., Gonioscopy was done with Goldmann goniolens to see the angles and Shaffer's grading were done. After this the provisional diagnosis was made and patient was asked to do HFA. The patient demography profile clinical as well as humphrey study was entered in the specific designed per-forma and then in the computer. Data were analyzed using SPSS program . Different analysis and test used for comparisons not mentioned.

Results

Majority of the patient fell in the age range of 21 to 30 years (38%). Among 50 patients enrolled in the study, maximum numbers of the patients were female (62%). The majority of the patients were students (40%). Among the Indo-Aryan and the Tibeto-Burman 32 patients (64%) were Tibeto-Burman. There was no significant correlation with glaucoma suspect and other ocular or systemic disease. Six patients had positive family history. Maximum numbers of the patients were myopic 21patients (42%). The intraocular pressure was 26mmof Hg and 28mm of Hg in Right and left eye

respectively (where is mean IOP 22). All the patients enrolled in the study were corrected to 6/6 visual acuity in both eyes with glass. Maximum number of patients 42(84%) had deep anterior chamber. On gonioscopy 49 patients had open angle. One patient had angle abnormalities. The maximum number of patients 15(30%) had C:D of 0.6:1. 14 patients had thin neuro retinal rim in both eyes. 2 patient had peripapillary atrophy. 39(78%) patients had glaucomatous hemifield test with in normal limits, 5(10%) had outside normal limit and 6(12%) had borderline. 45(90%) had open angle glaucoma suspect and 5(10%) had angle closure glaucoma suspect. Among the four types of glaucoma suspect Type I and Type II were in maximum number 17(34%) then the other types. There was significant p value (0.05) shown in relation of glaucomatous hemifield test and neural retinal rim. The incidence of glaucoma suspects attending the glaucoma clinic during the 1 year period were 8.64% and prevalence is 0.1802 in 1000 population.

Table 1. **Neuroretinal rim**

Total No of patient enrolled	Normal	Thinning NRR
50	36(72%)	14(28%)

Table 2. Ethnicity

Total No of patient enrolled	Indo -Aryan	Tibeto- Burman
50	18(36%)	32(64%)

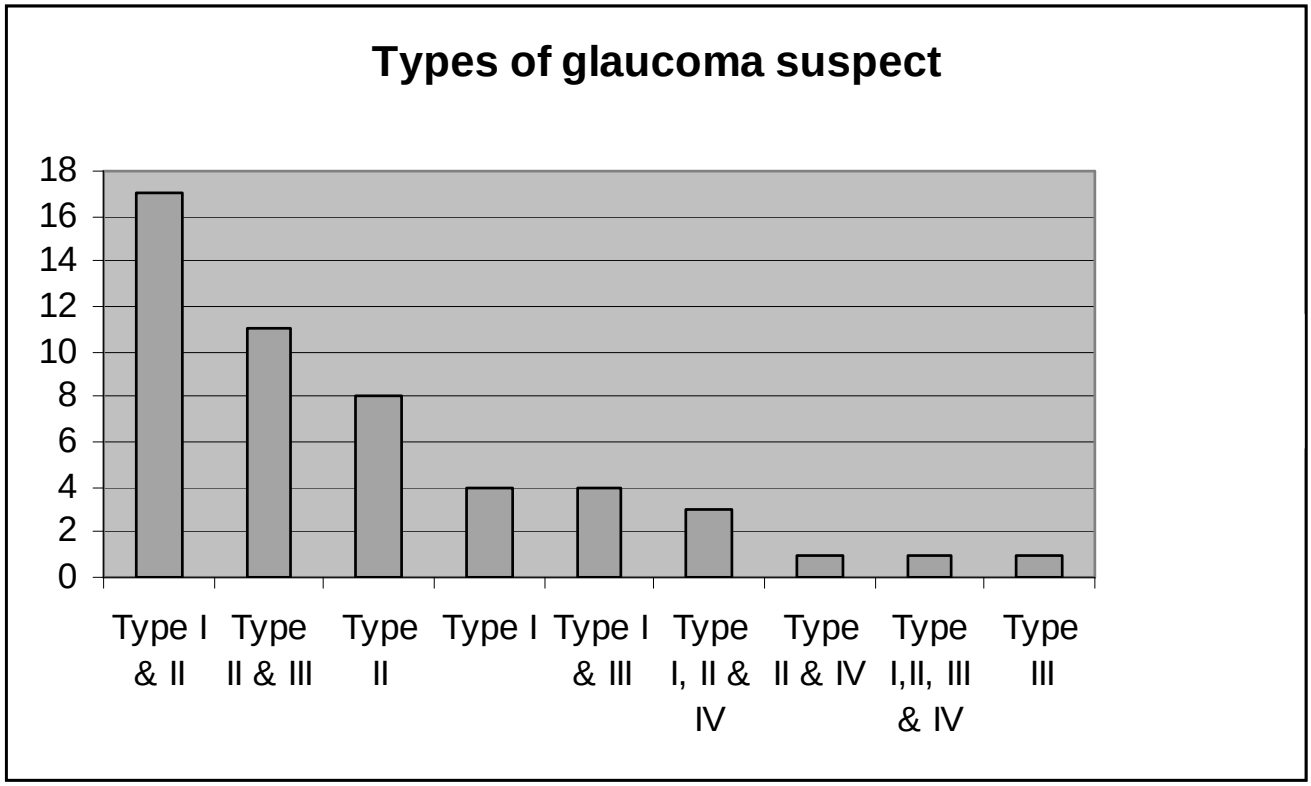
Table 3. Glaucomatous hemifield test

Total No of patient enrolled	Normal	Boarder line	Outside Normal limit
50	39(78%)	6(12%)	5(10%)

Table 4. Types of glaucoma suspects

Total No of patient enrolled	OAG suspect	ACG suspect
50	45(90%)	5(10%)

Table 5. Types of glaucoma suspects



Out of 50 right eyes of 50 patients maximum range of glaucoma suspect is type I and II 17(34%), then type II and III 11(22%), type II alone 8(16%), type I alone 4(8%), type I and III 4(8%),type I, II and IV 3(6%) , type III alone 1(2%), type II and IV 1(2%) and type I, II, III and IV 1(2%). That is minimum of type III alone, type II and IV and type I, II, III and IV. Similarly of the 50 left eyes type I and II is in the maximum range18(36%). The second type is Type II and III 11(22%). Type II alone 7(14%). Type I, II and IV 4(8%). Type I and III 3(6%). Type II and IV 3(6%). Type I 2(4%) and minimum of Type I, II and III 1(2%).

Discussion

As no such type of study is done in Nepal so for the early diagnosis of the cases of glaucoma it is one of the Glaucoma is a potential blinding condition, characterized by a progressive optic neuropathy with corresponding changes in the visual field[2]. Glaucoma is the second leading cause of blindness worldwide . Early detection and timely interventions are the keys to prevent visual deterioration caused by the disease. In this study the majority of the subject was between the 21-30 years and minimum were between 61-70 years . Similarly the study done in Austria suggests the disease increase with the age of 40 or older.[8] Similarly in Vijaya et. al. study with open angle glaucoma accounted for mean age 59.85/-10.43 years.[9] Hence in view of these studies older age is considered a risk factor for POAG which does not meet with this study.

The Barbador Eye Study highlighted the Public health importance of POAG in Afro-Caribbean region and has implication for other population. The prevalence of POAG by self reported race was 7% in black 3.3% in mixed race 0.8% in white and other participants.

There are no previous studies regarding the glaucoma suspect and ethnicity.

Family history of glaucoma is an important risk factor for the development of the disease. The study conducted by Shin et. al. reported that about 50% of POAG patients have a positive family history of glaucoma, which strongly suggests a genetic element to the development of POAG. In this study family history the strong risk factor for glaucoma (put data).[10, 11, 12]

The B zone of parapapillary atrophy as a whole was measured separately in four disk sectors. It was found that it was significantly larger and occurred significantly more frequently in the glaucomatous group than in the non glaucomatous group, which correlates with our study.[13] The study conducted at Hamilton Glaucoma Center, Department of Ophthalmology, U C San Diego, La Jolla, California Department of Ophthalmology, University of Mainz, Germany, University of Melbourne, Australia to determine the spatial relationship in neuroretinal rim parameter values between eyes in ocular hypertensive, glaucoma suspects, and glaucoma patients, which coincides with our study. Out of 50 patients enrolled in the study, 14 patients had thinning of the neural retinal rim[14]. Out of 14, 2 patients had borderline glaucomatous hemifield change 2 has outside the normal limit and 10 patients had within normal limit. The p value is 0.054 which is significant. Similarly in the LE 2 patients had borderline glaucomatous hemifield test and 3 had outside the normal limit and 9 patients had within normal limit. The p value is 0.058 which is significant[15].

In our study the sensitivity of Humphrey perimetry was 22% for the right eye and 24% for the left eye for glaucomatous visual field loss for the glaucoma suspect cases As all the patients enrolled in the study were glaucoma suspect so there is no specificity. Similarly study done by D. L. Budenz et. al. said that the new algorithms for measuring visual fields. SITA (Swedish interactive threshold algorithm) standard and SITA fast fields, had excellent sensitivity (98% and 95%) and specificity (92% and 82%) for glaucomatous visual field defects with considerable saving in time.[16] There is vast difference in the sensitivity between the field may be of number of the sample size and the programmed we have used SITA 24-2 programme.[17]

Conclusion

We conclude from this study that there is significant relation with thinning of neural retinal rim and glaucomatous hemifield test.

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