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Original Research Article

Conversion of Ocular Hypertensives into Glaucoma: A Retrospective Study

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ABSTRACT

Purpose: To assess the percentage of ocular hypertensive patients who progressed to glaucoma ,during a period of three years.
Design: Retrospective study.
Materials and Methods: Data of patients with ocular hypertension, in a tertiary eye care hospital of Bangalore, between January 2007 to January 2009 were analysed. Family history, medical and treatment history (systemic or ocular) were noted. At presentation visual acuity, refractive status, intraocular pressure, gonioscopy, visual fields, vertical cup disc ratio and central corneal thickness were noted. Follow up period was 36 months. On follow up, necessary examinations were done. Visual fields were repeated as and when deemed necessary. Depending on the risk factors, some patients were started on antiglaucoma and the rest were kept under observation. Patients who developed glaucoma at the end of 36 months in each group were noted.
Results: Total patients were 24, 12 males and 12 females. Mean age was 57.83 years. 6 were started on antiglaucoma medications due to various risk factors and the rest were kept under observation. 1 patient (17%) in the treatment group and 2 (11%) in the observation group developed glaucoma eventually . There was no significant difference in the number of patients developing glaucoma in both the groups[p=0.100].
Conclusion: The decision to treat ocular hypertension should depend upon many factors which should be judiciously analysed and then the treatment should be started by the ophthalmologist.

Key words: Ocular hypertension, Glaucoma, Risk Factors for glaucoma

INTRODUCTION

Ocular hypertension has been defined as intraocular pressure (IOP) greater than two standard deviation above the mean, above 21mm Hg by population based studies (mean IOP = 16 mmHg, normal range 10-21 mmHg), in absence of optic nerve damage or visual field loss. However 5% of the patients are found to have IOP over 21 mmHg (10 % over 40mmHg). Traditionally, people have struggled with the decision to treat these patients, who are referred to as ocular hyertensives. Criteria were lacking to distinguish those patients who are at higher risk for progression to glaucoma from those who will not progress to glaucoma without intervention. Ocular Hypertension Study was one of the landmark studies, which

predicted the progression ocular hypertension patients to open angle glaucoma.

The treatment of ocular hypertension has been problematical in the few decades since it was recognized by Chandler [1] and Armaly [2] that only a minority of such patients were destined to develop glaucomatous damage. On the conservative side, many glaucoma specialists advocate following such patients without treatment unless the intraocular pressure (IOP) is quite high (e.g., 30 mm Hg) [3] or if it is difficult to be sure that the optic disc and visual field are normal. It is reasoned that observation alone allows timely intervention if damage begins, long before visual loss of consequence to the patient would occur, that in this way as many as 80% of patients with ocular hypertension avoid the cost and adverse effects of therapy, and that there is actually no convincing evidence that treatment delays or prevents damage.

On the other side of the debate, it is argued that up to 20% to 50% of the optic nerve fibers may be lost focally before damage is recognized by conventional perimetry [4,5] and that perhaps damage, once initiated, makes the remaining optic nerve fibers more susceptible to further damage. Furthermore, patients are more likely to be lost to follow-up if not treated [6] and patients might blame the physician if substantial damage occurs before detection or if the first visual defect happens to be an annoying paracentral scotoma. Elevated IOPs also increase the risk of central retinal vein occlusion, which could cause sudden, irreversible visual loss.

Finally, helpful guidance has arrived in the form of 2 landmark reports. In the first, Kass et al [7] report the 5-year outcome of the Ocular Hypertension Treatment Study (OHTS) and clearly show that treatment is effective in delaying or preventing glaucomatous optic disc and/or visual field loss. Some 9.5% of controls and 4.4% of those treated developed confirmed damage. In the companion report, Gordon et al [8] provide useful insight regarding the risk factors that identify those patients with ocular hypertension who are, and those who are not, at special risk for developing disc and/or field changes.

Aim:

To assess the percentage of ocular hypertensive patients who progressed to glaucoma, during a period of three years.

Type Of Study: Retrospective study.

MATERIALS AND METHODS

Data of patients diagnosed with ocular hypertension, presenting to a tertiary eye care hospital in Bangalore, between the time period of January 2007 to January 2009 were collected and analysed. Demographic profile, family history, medical history and treatment history (systemic or ocular) were noted.

At presentation visual acuity, refractive status, IOP (goldman's applanation), gonioscopy, visual fields, vertical cup disc ratio and central corneal thickness were noted. These patients were followed up for a period of 36 months.

On follow up examinations, IOP, visual acuity, slit lamp examination and assessment of optic nerve head was done. Visual fields were repeated as and when deemed necessary by the treating physician. The number of patients who were started on ocular hypotensive medications and those who were not, were noted.

Inclusion criteria:

1. Patients with IOP more than 21 mm Hg, in at least one eye.
2. Age 40 to 80 years.
3. Normal optic discs in both the eyes on clinical examination
4. Normal and reliable humphrey 30-2 visual fields for both the eyes.

Exclusion criteria:

1. Patients with any previous intraocular surgery (other than uncomplicated cataract surgery with PCIOL).
2. Diabetic retinopathy or any disease causing visual field loss or optic disc deterioration.
3. Those with best corrected visual acuity of 20/40 in either eye.
4. Exfoliation syndrome or pigment dispersion syndrome.
5. Patients with underlying ocular or systemic condition that may contribute to optic nerve head or visual field damage.

Statistical Analysis:

The Statistical analysis was done using a software SAS 9.2 and Microsoft word and Excel were used to generate graphs, tables etc.

P value: P = 0.100 was not significant.

RESULTS

Total number of patients was 24 with 12 males and 12 females. [Chart-1] Mean age was 57.83 years. There was no history of any prior treatment or any ocular disease.5 patients had diabetes and 6 had hypertension.1 patient gave history of migraine. None of them had any vascular abnormalities. Family history of glaucoma was present in 3 patients. Two patient's mother and one patient's father was affected.7 patients were myopes and 2 were high myopes Among these patients , 6 were started on antiglaucoma medications, rest of them were kept under observation. Out of the 6 patients started on antiglaucoma medications, all had pressures above 23 mmHg in both the eyes. Among them 3 had family history of glaucoma [2 mothers,1 father] , 1 patient was a high myope [-8.0 D OD ; -7.0 D OS] , 1 patient had thin central corneal thickness [OU : 465 µm] , 1 patient had thin central corneal thickness [OU : 473 µm] along with high myopia [OD: -6.75 D ; OU -7.5 D]

One patient among these, who had a family history of glaucoma along with high baseline pressures showed increase in vertical cup disc ratio with inferior neuro retinal rim thinning, at the end of 3 years, with visual field changes correlating with the same.

Of the observation group, 2 patient showed disc changes in one eye at 3 years of observation. There was increase in cup to disc ratio, with early visual field changes suggestive of glaucomatous damage. Both these patients had intraocular pressure more than 25 mmHg constantly in the affected eye.

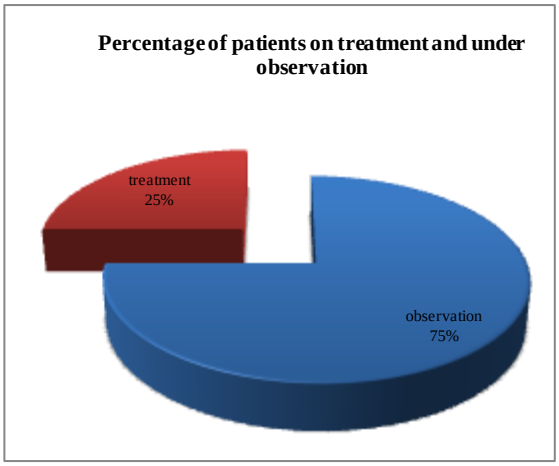

Chart -1

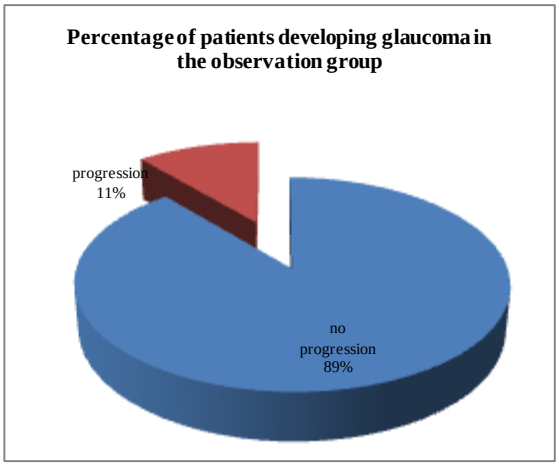

Chart -2

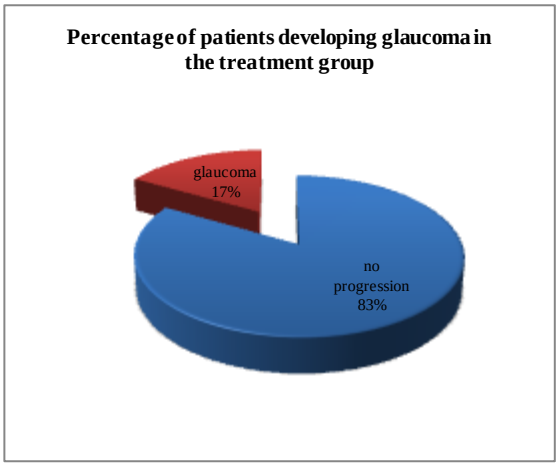

Chart -3

Thus in treatment group, out of 6, 1patient developed glaucoma [17%] and in observation group out of 18, 2 patients developed glaucoma [11%]. (Chart -2 and 3)This was not found to be clinically significant [p = 0.100].

DISCUSSION

The question of proper treatment of ocular hypertension has plagued ophthalmologists for a century. The dilemma derives from the fact that ocular hypertension per se is a risk factor and not a disease. The Ocular Hypertension Treatment Study addressed some of these issues and provided guidelines for making initial therapeutic decisions. However each patient must be evaluated as an individual.

The study addressed the effects of lowering IOP by 20% in patients with moderate ocular hypertension.

The risk factors found to be most significant in predicting field loss in untreated eyes compared with treated eyes were 1) the level of IOP , 2) the appearance {cup to disc ratio } of the optic nerve head 3) the patient's age and 4) the corneal thickness. As we would expect higher IOP's and large cup to disc ratio were associated with increased risk of developing glaucoma during the study period. Older age and thin corneas were also associated with an increased risk of developing glaucoma. Although the mechanisms responsible for the link between glaucoma and myopia are poorly understood, it has been postulated that the optic nerve head in myopic eyes may be structurally more susceptible to glaucomatous damage because of the changes in connective tissue structure and arrangement. [9] The Blue Mountains Eye Study, one of the more frequently cited studies when discussing the association between myopia and glaucoma, after adjusting for age, sex, and other risk factors, found a strong relationship between POAG and myopia, with an odds ratio of 2.3 in eyes with low myopia (between -1.0 and -3.0D) and 3.3 in eyes with moderate-to-high myopia (>-3.0D) [10] In the Barbados Eye Study, a myopic refraction was one of several risk factors for POAG in adult black people. [11] The Beaver Dam Eye Study showed that, after taking into account the effects of age, sex, and other risk factors, persons with myopia were 60% more likely to have glaucoma than those with emmetropia. [12] In Asian populations, the Singapore Malays Eye Study showed an association between moderate or high myopia (worse than -4D) and POAG. Persons with moderate or high myopia had an almost 3 times higher risk of POAG compared with those with emmetropia. Taking all these risk factors into consideration, the patients in our study were treated accordingly.

In this study, 11% of the patients developed glaucoma in the observation group which is comparable to that of The Ocular Hypertension Treatment Study where 10.86% of people developed glaucoma. In this study 17% of patients among the treated group developed glaucoma contrary to 4.4% in The Ocular Hypertension Treatment Study.

CONCLUSION

The decision to treat ocular hypertension should depend upon many factors. These factors are (1) the lower overall incidence of POAG among individuals with ocular hypertension in population based studies (2) the burden of long term treatment, including possible adverse affects, cost and inconvenience (3) the individual's risk of developing POAG (4) the individual's likelihood of being helped by treatment and (5) the individual's health status and life expectancy.

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