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Research Article

A CLINICAL STUDY ON MANAGEMENT OF PRIMARY OPEN ANGLE GLAUCOMA

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ABSTRACT

Objective: To evaluate the effectiveness of medical and surgical therapy in patients of Primary open angle glaucoma.
Materials and Methods: Cross-sectional study conducted among 50 patients attended to the ophthalmic department of Government General Hospital, Guntur from November 2004 to November 2006.
Results: Primary open angle glaucoma characteristically has an adult onset seen commonly after the age of 40 years and is a bilateral almost symmetrical disease; more common in males. IOP of most of the eyes is between 20 – 30 mm Hg; Cup: Disc ratio in most of the cases is 0.6:1 & 0.7:1 in both sexes. Most common visual field defect in POAG is arcuate scotoma, Superior arcuate scotoma is most common. Most of the eyes showed advanced field loss.

INTRODUCTION

Glaucoma is a disease characterized by apoptosis, ganglion cell death related at least in part to intra ocular pressure. Ganglion cell death that causes a characteristic optic nerve change namely progressive narrowing or loss of the neuro retinal rim, is the hallmark of glaucoma. Glaucoma is recognized as a major cause of ocular morbidity worldwide. About 66.8 million people are affected by Glaucoma worldwide and 6.7 million are bilaterally blind due to this disease. Quigley and Broman (BJO. AUG.2006) Project states that 8.4 million people will be blind from primary glaucoma by 2010, rising to 11.1 million by 2020. According to Andhra Pradesh Eye Disease study, primary open angle glaucoma in subjects more than 30 years of age is 1.62% and more than 40 years age is 2.56%.Target for 10th plan is to reduce prevalence of blindness to 0.8% by 2007 from 1.1% in 2001 – 2003. "Facilities for early diagnosis and treatment of glaucoma" is included in the plan. Vision 2020 program involve consideration of screening strategies for early identification of this condition and prompt management. There is no doubt that glaucoma suffers from image problem and is viewed certainly as a major cause of blindness and is classified as avoidable by W.H.O. but the fact that it is irreversible, difficult to detect and difficult to treat means that it is often viewed as less of an urgent issue, particularly in developing nations where other more remediable disease such as cataract are more prevalent. Yet optic disc assessment and tonometry require little specialist skill or sophisticated equipment and have reasonably high specificity in detection of advanced glaucoma. These patients present and to comply with treatment.

Efforts need to be made to train general medical and ophthalmic personnel in recognition of the disease and to highlight awareness of glaucoma in both the medical community and the general population. There is no doubt that more prevalence data would be useful, as there is a need to act using the available data by improving awareness, case detection and treatment of glaucoma in India. This study is mainly to evaluate the effectiveness of medical therapy and effectiveness of surgical therapy in the control of Intra ocular pressure, cupping of the disc and visual field defects in patients of Primary open angle glaucoma (POAG) attending the Department of ophthalmology, Government General Hospital, Guntur.

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MATERIALS AND METHODS

The present was undertaken in patients attending ophthalmic department of Government General Hospital, Guntur from November 2004 to November 2006.

Selection of Cases

Among the patients who were attending the department of ophthalmology Government General Hospital, Guntur, 50 cases of Open angle glaucoma were selected for this study. The following criteria was under taken to establish the diagnosis of Open angle glaucoma.

Intra ocular pressure, fields, fundus examination for optic nerve head analysis and retinal nerve fibre defects, visual acuity. One patient lost one eye. Total 50 cases i.e. 99 eyes. All the cases were recorded in detail regarding history, complaint, duration, present illness, past illness, systemic illness and ophthalmic examination, anterior segment; posterior segment was done with slit lamp biomicroscopy, direct ophthalmoscopy, and indirect ophthalmoscopy where ever necessary. Investigations like Intra ocular pressure with Applanation Tonometry, visual fields, gonioscopy were performed in all cases. Among the 50 cases of primary open angle glaucoma 36 cases were controlled with medical treatment alone, rest of the 14 cases were subjected to surgery i.e., trabeculectomy at 12º clock position of the corneoscleral junction under peri bulbar anaesthesia, with limbal based conjunctival flap. All these cases were treated post operatively with local steroid antibiotic drops, cycloplegic drops systemic antibiotics depending upon the post operative condition of the eye. All those cases who need medical treatment were treated as out patients. Those who needed surgery were admitted in the Ophthalmic ward. Established cases of POAG were kept under medical and surgical treatment and followed:

Medical treatment was given with the following drugs:

- TIMOLOL eye drops 0.5% twice in a day
- BETAXOLOL eye drops 0.5% twice in a day
- BRIMONIDINE eye drops 0.2% twice in a day
- LATANOPROST eye drops 0.005% once at night time.

Intra ocular tension	No. of patients	Medical treatment
< 20mm of Hg	7	TIMOLOL
21to 25mm of Hg	19	TIMOLOL & BRIMONIDINE till IOP is reduced to less than 20 mm Hg, then TIMOLOL for maintenance.
>25mm of Hg	73	TIMOLOL+BETAXOLOL+ LATANOPROST till IOP is reduced to target pressure then TIMOLOL for maintenance.

After keeping the patient under medical treatment these cases were followed in this schedule: Weekly review for one month, Fort nightly review for two months, Monthly review for six to twelve months. The patients were followed periodically for intra ocular pressure, vision, visual fields and fundus findings. The relevant conclusions were drawn and summarized.

RESULTS

As shown in Table 1 Primary Open Angle Glaucoma is seen more commonly i.e. 34% in the age group of 41 – 50 years and is observed to be more after 40 years of age. Incidence of Primary Open Angle Glaucoma is seen more in male patients i.e. 60% as compared to 40% in females, as shown in Table 2.

Table 1. Incidence of primary open angle glaucoma by Age

Age in Years	No. of cases	%
21 - 30	1	2
31 - 40	3	6
41 – 50	17	34
51 – 60	14	28
61 – 70	12	24
71 – 80	3	6
Total	50	100

TABLE 2. Sex – Wise distribution

Sex	No. of cases	%
Male	30	60
Female	20	40
Total	50	100

Table 3. Intra Ocular Pressure with Applanation Tonometry

IOP in mm of Hg	No. of eyes	%
15 – 20	7	7.0
21 – 25	19	19.2
26 – 30	73	73.8
Total	99	100

Incidence of Primary Open Angle Glaucoma is observed to be more after 40yrs in both sexes Fig.1. Intra Occular Pressure range in the majority of the cases (73.8%) of Primary Open Angle Glaucoma is between 26 – 30 mm of Hg.

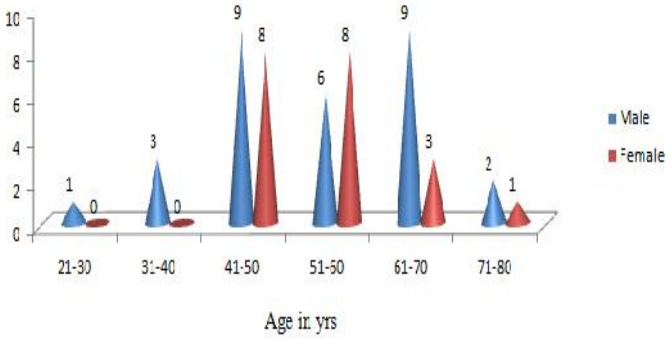

Fig. 1.

Sex wise distribution of intra Ocular Pressure with Applanation Tonometry

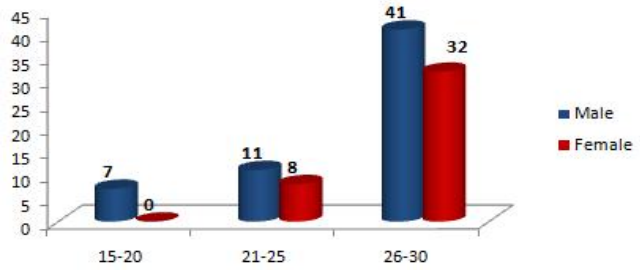

Fig. 2. IOP in mm of Hg

Intra Occular Pressure as measured by Applanation Tonometry is between 26 – 30 mm Hg in 41(69%) of males and 32(80%) of females as shown in Fig. 2. In the present study vertical cup disc ratio in majority of the cases is 0.6:1 and 0.7:1 in both sexes Table 4.

Now known that IOP in general population is not represented by a guassian distribution but is skewed toward higher pressures. Several studies have indicated that as many as 50% of patients who have glaucomatous optic neuropathy and / or visual field loss have initial screening IOP below 21 mm of Hg.

Table 4. Glaucomatous Cupping using +78 D with slit lamp examination

C D Ratio	No. of eyes in Male	No. of eyes in Female	Total no. of eyes
0.3	1	0	1
0.4	4	4	8
0.5	9	6	15
0.6	17	14	31
0.7	16	8	24
0.8	8	7	15
0.9	4	1	5
Total	59	40	99

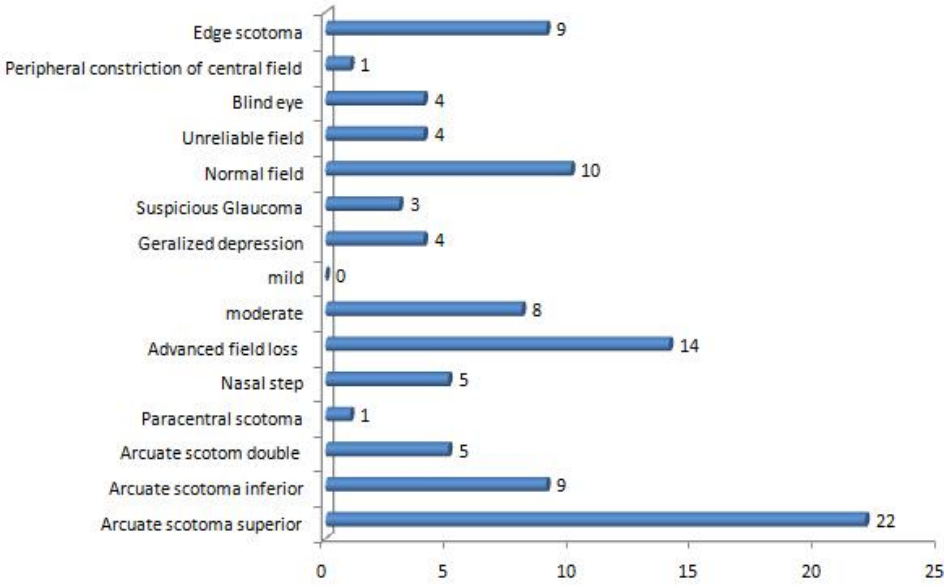

Fig. 3.

Field Defects in 99 Eyes of 50 Patients

Arcuate scotoma is the most common field defect observed in glaucoma patients. From this Table it is evident that findings of this study correlate well with established standards and also the superior arcuate scotoma (22.22%) is more common than inferior (9.09%) is also consistent in this study. In this study generalized depression is seen in 4%. Suspicious defect in 3%, normal field in 10% and unreliable in 4% of eyes observed.

DISCUSSION

Glaucoma is one of the Major causes of ocular morbidity. Worldwide 66.8 million people are affected. In Andhra Pradesh Eye – Disease study, the prevalence of POAG in population above 30 years is 1.62% and above 40 years is 2.56%. The Prognostic significance of sex is less clear than that of age and race; though some studies suggest a higher prevalence among men. Similar findings (60%) were observed in the present study. The IOP is the only major modifiable risk factor for primary open angle glaucoma. The IOP is greater than two standard deviations above the normal limits the mean IOP of 15.5 ± 2.57 mm Hg has often been defined as "abnormal" in many cases as glaucoma.

may occur only intermittently in some glaucomatous eyes. Although elevated IOP is still considered a key feature of glaucoma it is not considered essential to its diagnosis.

Most normal eyes have a vertical cup-disc ratio of 0.3 or less. In early glaucoma asymmetry of 0.2 or more between the eyes is significant. The neuroretinal rim shows a characterstic configuration. The inferior rim is the broadest, followed by superior, nasal and temporal (ISNT). Pathological cupping is caused by an irreversible decrease in the number of nerve fibers, glial cells and blood vessels. The blood vessels from within the optic nerve enter the disc centrally and then course nasally following the edge of the cup. The central retinal artery is usually nasal to the vein.

Visual field defects are influenced by clarity of ocular media, pupil size, refractive errors, increasing age and learning effects. Glaucomatous field defects in primary open angle glaucoma is more common in para central area and Bjerrum's areas. According to Aulhorn and Harms 1967 paracentral scotoma is frequently found in the superior rather than the inferior field, or more common in the arcuate areas, and are only rarely found at the macular or the inferotemporal region. In this study paracentral scotoma is found in only one eye.

Because the disease is asymptomatic the patients won't turn up in the early stages. Thus it is difficult to pickup patients with early field defects in POAG. So it is rare to record such an early defect.

Arcuate Scotoma: is the most common field defect observed in the study as most of the patients will seek medical aid in this stage. Superior arcuate defects are more common than those of inferior in this study. Nasal step occurs in a large percentage of eyes with early field loss, according to Aulhorn and Harms (1967), it is 0.7%, Armaly (1971), it is 1.9%. L E Blanc and Becker (1971) it is 11% Drance et al (1979) it is 20% and Le Blanc et al (1985) it is 0%. In this study it is 5%. Wide spread field loss is observed in 14.14% of patients in this study it is less than that with the study of Aulhorn and Harms (1967), Armaly (1971), Hart and Becker (1982).

Diffuse Loss: In this study mild and moderate defects of defuse field loss in glaucoma occurs as a 8% and 4 % respectively.

Advanced Field Loss: This occurs in 25% of cases in this study. Advanced loss occurred more commonly here because, the disease itself is asymptomatic. The patients did not find any difficulty in their activities, as central vision is last to be affected, So most patients are seen in advanced stage in this study.

Generalized Depression: Generalized depression without exaggerated loss in localized regions most often is the result of cataract or other preretinal factors. But it can rarely occur in glaucoma. It can be diagnosed well in correlation with the clinical findings.

Suspicious Glaucoma: In a few eyes the field showed suspicious glaucoma. Mean deviation may show mild defect. GHT within normal limits, and disc may show glaucomatous defects.

Normal Field: In 10% of cases the other eye is normal, as the disease even though bilateral, is asymmetric.

Unreliable: In 4% of eyes the field was unreliable due to fixation losses > 20% or high false positive or high false negative errors.

Blind: In this study 1% of eyes were blind due to pthisis bulbi eye due to trauma in childhood in which fields could not recorded.

Conclusions

Primary open angle glaucoma characteristically has an adult onset seen commonly after the age of 40 years and is a bilateral almost symmetrical disease; more common in males.

In this study IOP of most of the eyes is between 20 – 30 mm Hg; Cup: Disc ratio in most of the cases is 0.6:1 & 0.7:1 in both sexes. Most common visual field defect in POAG is arcuate scotoma, Superior arcuate scotoma is most common. Most of the eyes showed advanced field loss. After medical treatment Intra ocular pressure and fields got stabilized.In this study out of 50 cases 14 cases underwent surgery i.e., trabeculectomy with limbal based conjunctival due to factors like non-compliance of the patient cost-effectiveness of the drugs and ineffective medical treatment. Hence with good compliance and regular follow up of patient with recording of intra ocular pressure, optic disc examination, field recording the medical management is superior to surgical intervention as proved in this study.

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