Section: Ophthalmology

Original Research Article

A COMPARATIVE STUDY OF MODALITIES OF MANAGEMENT OF PSEUDOEXFOLIATION GLAUCOMA IN A TERTIARY EYE CARE HOSPITAL

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ABSTRACT

Background: Inflammatory bowel disease (IBD), comprising Crohn's disease and ulcerative colitis, is a chronic immune-mediated disorder of the gastrointestinal tract associated with significant morbidity. Assessment of disease activity commonly relies on endoscopy and histopathological examination; however, these approaches are invasive, costly, and impractical for repeated evaluation. This has prompted interest in accessible blood-based inflammatory markers. The neutrophil-to-lymphocyte ratio (NLR), obtained from routine complete blood counts, reflects systemic inflammatory responses and may correlate with intestinal disease activity. The aim is to evaluate the relationship between neutrophil-to-lymphocyte ratio and histopathological disease activity in patients with inflammatory bowel disease. **Materials and Methods:** This is a Cross-sectional, descriptive study of 3018 patients above the age of 40 years visiting outpatient department of Lion's NAB Eye Hospital, Miraj during a period of two years. Different modalities of treatment medical, trabeculectomy and combined surgery were done as appropriate for Pseudoexfoliation glaucoma. Outcome and operative complications were noted and compared. **Result:** In this study 23.25% cases were kept on medical line of treatment with regular monitoring for control of glaucoma. 32.55% cases underwent trabeculectomy; while combined surgery (Trabeculectomy + Cataract extraction) was done in 44.20% cases. Medical line of therapy could control intraocular pressure in 23.25% cases only. The others required surgical line of therapy for control of glaucoma. Trabeculectomy and combined surgery were performed in rest 76.75% cases. Out of these cases 4 cases were controlled with medical therapy post-operatively. Findings show that zonular weakness leading to dialysis of zonules (42.10%) and pigment dispersion (31.56%) occurred frequently during surgery in cases of pseudoexfoliation. Vitreous loss, posterior capsule rent and sphincter damage were also noted in some cases. **Conclusion:** Prognosis depends on the stage of glaucoma, association with subluxation, myopia, or vitreous degeneration. More than half cases showed a very good visual prognosis while a minority of 6.4% cases showed no improvement.

INTRODUCTION

Pseudoexfoliation syndrome is not an uncommon ocular ailment which is characterized by deposition of fine, flaky material on the anterior lens capsule at the pupillary margin, zonules of Zinn; internal limiting membrane of iris, ciliary body, their epithelial surfaces and around the vessels of anterior uveal tissue, extra bulbar tissues like vessels at limbus and palpebral conjunctiva. This 'dandruff-like' white flaky material was first described by Lindberg (Finland) in 1917.[1] This condition, now commonly known as pseudoexfoliation of lens, was later also noted as flakes on anterior surface of the lens by Malling (1923) in Norway.[2] But it was Vogt (1923-32),[3] who first published an accurate description of the disease under the name of 'superficial exfoliation of the anterior capsule of the lens' and called the consequential rise in tension - Glaucoma Capsulare. Busacca (1929),[4] demonstrated that lens capsule consists of many layers histologically, while Dvorak – Theobald

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(1954),[5] coined the term 'pseudoexfoliation' of lens capsule.

The condition is commonly seen in old age and is often found to be associated with raised intraocular pressure and also cataract. When averaged across the globe, it is the most common identifiable cause of secondary open angle glaucoma. It is not unusual to find a considerable number of cases in Indian population, especially while screening patients for cataract. Both Glaucoma Capsulare and chronic simple glaucoma are open-angle glaucomas, but glaucoma capsulare shows increased pigmentation at the angle and is more difficult to control as it responds poorly to treatment. The prognosis also is poor as compared to Chronic simple glaucoma.

This condition has certain risks during cataract surgery, such as zonular dialysis, capsular rupture and vitreous loss. As it is usually associated with weak zonules of Zinn which may give rise to higher incidence of subluxation of lens and phacodonesis. It also causes disturbance in the blood aqueous barrier. Ophthalmologists in India may wish to focus on the detection of pseudoexfoliation for the fact that pseudo exfoliation may be used as a marker to aid in the detection of glaucoma.[3] Thus, considering the clinical importance of pseudo exfoliation, a study was carried out in this institute "Lions NAB Eye Hospital" Miraj is a tertiary care eye hospital where large number of patients suffering from various eye diseases report every day for necessary treatment. The present study is aimed comparing modalities of management of pseudoexfoliation glaucoma in a tertiary eye care hospital.

MATERIALS AND METHODS

This study of pseudoexfoliation was conducted at Lions NAB eye hospital Miraj with following criteria.

Inclusion criteria:

1. The cases included in the study must have unequivocal features of pseudoexfoliation syndrome in one or both eyes.
2. There will be no age or sex bar including the cases into study.
3. The final inclusion of cases will be on the basis of an established diagnosis of glaucoma with the presence of pseudoexfoliation syndrome.

Exclusion criteria

1. Doubtful cases of pseudoexfoliation syndrome.
2. Cases who have undergone any surgery for cataract or glaucoma.
3. Doubtful cases of glaucoma even if pseudoexfoliation syndrome is present.

In this study, 3018 patients above the age of 40 years visiting outpatient department of Lion's NAB Eye Hospital, Miraj during a period of two years from February 2008 to February 2010 were examined. A standard questionnaire was prepared to note down the findings of examinations. These patients underwent thorough routine ophthalmic examination including slit lamp biomicroscopy to establish the diagnosis of pseudoexfoliation syndrome. Those who were identified as having the above disorder were subjected to screening tests to detect glaucoma. These included recording of IOP using Perkin's applanation tonometer, diurnal variation in patients with normal IOP, visual field analysis, gonioscopy, central corneal thickness wherever possible and fundus examination.

Those found having glaucoma were kept under survey and were advised to undertake treatment as per the prescribed protocol. Patients having IOP above the normal range, but not showing optic disc pathology of glaucoma and defects in visual field analysis were provisionally labelled as ocular hypertensives and were advised follow up to see if in future they exhibited glaucomatous changes. Cases of pseudoexfoliation with features of open angle glaucoma were advised regular follow up visits to see if the prescribed drugs effectively controlled the IOP and prevented further changes in the visual fields and fundus pictures.

RESULTS

In this hospital based, cross-sectional, comparative study, a total of 3018 patients visiting the ophthalmic out patient department during a period of one year were screened. Of these 3018 patients, 120 patients were cases of pseudoexfoliation syndrome. This accounts for 3.976% of the study population. Nearly equal number from both sexes were screened with slight male preponderance in attending OPD. The Male to female sex ratio of screened population was 1: 1.15.

[Table 1] shows the Distribution of the exfoliation syndrome in the study population by various characteristics. The maximum age distribution of pseudoexfoliation syndrome is seen in the age group of >79 yrs (30%), while it was quite low between 40-49 yrs (2.9%). It is evident that the incidence of pseudoexfoliation syndrome progressively increases with increasing age. There is a definite higher prevalence of pseudoexfoliation syndrome in males as evident from the table 1 (68.33%). Pseudoexfoliation syndrome usually manifests bilaterality in majority of cases (74.17%). About 43 cases (35.83%) of pseudoexfoliation cases had glaucoma. The majority of cases of glaucoma in pseudoexfoliation syndrome group belonged to open angle type (76.74%). Table 2 shows the presence of pseudoexfoliation material on papillary margin as the constant feature (100%). The other sites where pseudoexfoliation material was found to be deposited include anterior lens capsule, zonules and angles (trabecular meshwork).

[Table 2] shows modalities of treatment for pseudoexfoliation glaucoma and operative complications. In this study 23.25% cases were kept on medical line of treatment with regular monitoring for control of glaucoma. 32.55% cases underwent

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trabeculectomy; while combined surgery (Trabeculectomy + Cataract extraction) was done in 44.20% cases. [Table 2] shows that zonular weakness leading to dialysis of zonules (42.10%) and pigment dispersion (31.56%) occurred frequently during surgery in cases of pseudoexfoliation. Vitreous loss, posterior capsule rent and sphincter damage were also noted in some cases. Rest of cases did not encounter any difficulty.

Table 1: Distribution of the exfoliation syndrome in the study population by various characteristics.

Character	n	%
Age distribution of pseudoexfoliation syndrome		
40 – 49 yrs	3	2.5
50 - 59 yrs	21	17.5
60 – 69 yrs	28	23.3
70 – 79 yrs	32	26.6
More than 79 yrs	36	30
Gender		
Male	82	68.33
Female	38	31.67
Laterality		
Unilateral	31	25.83
Bilateral	89	74.17
Glaucoma presence		
Glaucoma presence with pseudoexfoliation syndrome	43	35.83
Angle Configuration of glaucoma (n = 43)		
Open angle	33	76.74
Narrow angle	8	18.61
Closed angle	2	4.65
Distribution of pseudoexfoliation by site		
Pupillary margin	120	100
Anterior capsule	84	70
Zonules	42	35
Angles (Trabecular meshwork)	36	30

Table 2: Modalities of treatment for pseudoexfoliation glaucoma and operative complications.

Parameter	n	%
Modality of treatment (n=43)		
Medical treatment	10	23.25
Trabeculectomy	14	32.55
Combined surgery (Trabeculectomy + Cataract extraction)	19	44.20
Operative complications in pseudoexfoliation (n=43)		
Zonular Dialysis	8	42.10
Pigment dispersion	6	31.59
Posterior dislocation of nucleaus	1	5.26
Posterior capsular rent	2	10.54
Vitreous loss	2	10.54
Sphincter damage	2	10.54

DISCUSSION

In the present study, all 43 cases of glaucoma were put on medical line of treatment first. Only 23.25% of those were controlled on medical therapy alone. The others needed surgical intervention. Trabeculectomy was done in 32.55% cases while in 44.18% of the cases combined surgery (trabeculectomy+cataract surgery) was performed. Only 4 patients i.e. 9.3% required additional medical treatment post-operatively while the intraocular pressure in the other cases was well controlled when recorded at the end of 6 weeks post-operatively. Many authors report that medical line of therapy for glaucoma capsulare is often insufficient.6 Cairns JE 19687, Watson 19698, Ridgeway et al., 19729 and Thyer and Wilson 197210 have proved trabeculectomy to be the drainage surgery of choice in glaucoma in pseudoexfoliation.

Thus, it can be said that it is difficult to control the glaucoma associated with pseudoexfoliation with medical therapy alone and most of the patients require filtering surgeries. The lens capsule is thought to be the cause for production of pseudoexfoliation and when it is removed, it results in fall in intraocular pressure. It is said that the exfoliation material already deposited in the trabecular meshwork is gradually cleared once the production ceases and could be due to some modification of trabecular function following lens removal and flattening of iris diaphragm. Also, in accordance with previous studies, this study shows that trabeculectomy is an effective means of control of intraocular pressure in glaucoma in pseudoexfoliation and it should be

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combined with cataract extraction in cases where glaucoma capsulare is associated with cataract.

CONCLUSION

In conclusion, medical line of therapy could control intraocular pressure in 23.25% cases only. The others required surgical line of therapy for control of glaucoma. Trabeculectomy and combined surgery were performed in rest 76.75% cases. Out of these cases 4 cases were controlled with medical therapy post-operatively. A reduction in intraocular pressure was observed after cataract extraction. Prognosis depends on the stage of glaucoma, association with subluxation, myopia, or vitreous degeneration. More than half cases showed a very good visual prognosis while in 6.4% cases there was no improvement.

REFERENCES

1. Lindberg J G. Clinical investigations on depigmentation of the pupillary border and translucency of the iris in cases of senile cataract and in normal eyes in elderly persons (1917) (reprinted). Acta Ophthalmology 1989 ; 67 (suppl 190) : 1-96.
2. Malling B. Untersuchung Uber das Verhalitnis Zwischen Iridocyclitis und Glaukom. Acta Ophthalmology (Kobenhavn) 1923;1:97.
3. Vogt A. Ein neues Spaltlampenbild des Pupillengebiets: Hellblauer Pupillensaumfilz mit Hautchenbildung auf der Linsenvorderkapsel. Klein Monatsbl Augenheilkd 1925; 75: 1-12.
4. Busacca A: Struktur und Bedeutung der Hautchenniederschlage in der vorderen und hinteren Augenkammer. Graefe Arch Ophthalmology 1927; 119: 135-153.
5. Dvorak- Theobald G. Pseudo-exfoliation of the lens capsule. Am J Ophthalmology 1954; 37: 1-12.
6. Jerndal T and Kriisa V. Results of trabeculectomy for pseudoexfoliative glaucoma. Br J Ophthalmol 1974; 58 :927.
7. Crains J E. Trabeculectomy. Preliminary report of a new method. Am J Ophthalmol 1968 Oct;66(4):673-9.
8. Watson P G. Trabeculectomy. Dev Ophthalmol 1981:1:61-70.
9. Ridgeway A E, A Rubinstein K and Smith V H. Trabeculectomy. A study of 86 cases. Br J Ophthalmol 1972 Jul;56(7):511-6.
10. Thyer H W, Wilson P. Trabeculectomy. Br J Ophthalmol 1972 Jan;56(1):37-40.

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