ORIGINAL RESEARCH PAPER

Ophthalomology

"TO STUDY THE RELATION BETWEEN PSEUDOEXFOLIATION AND OPEN ANGLE GLAUCOMA IN PATIENTS VISITING TERTIARY EYE CARE CENTRE"

KEY WORDS:
Pseudoexfoliation, glaucoma, pseudoexfoliation syndrome, vision loss

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ABSTRACT

Introduction: Pseudoexfoliation syndrome is a systemic condition in which exfoliative material accumulates in organs other than the anterior structures of the eye, such as the heart, blood vessels, lungs, and meninges. It is frequently associated with open angle glaucoma, known as pseudoexfoliation glaucoma. **Material and Methods:** A study of 117 eyes of 77 patients diagnosed with ocular pseudoexfoliation visiting outpatient department of tertiary eye care centre and who were above 40 years of age was done. The evaluation included age and gender of patients, detailed history, visual acuity, slit lamp examination, intraocular pressure, pachymetry, visual field analysis and cup-disc ratio evaluation. **Results:** In a study period of 2 years, out of total 77 patients, 51 (66.23%) patients were male and 26 (33.76%) were female with mean age of 64.43 years. We observed that 10(15.62%) had mild disc changes, 23(35.93%) had moderate disc changes, whereas 25(39.06%) had severe disc changes and 35(54.68%) patients had severe field defect whereas only 6(9.37%) had moderate field defect. Out of 117 eyes of 77 patients, 64(54.70%) eyes were diagnosed with glaucoma whereas 53(45.29%) eyes did not have glaucomatous changes. **Conclusions :**This study shows positive relation between pseudoexfoliation and open angle glaucoma. Hence careful eye examination of people having pseudoexfoliation is mandatory for early diagnosis and treatment of glaucoma which can prevent glaucoma related visual loss.

INTRODUCTION:

Glaucoma is defined as an idiopathic, multifactorial optic disc neuropathy with characteristic disc changes & visual field changes and intraocular pressure being a major risk factor. (1) The worldwide major cause of irreversible vision loss is glaucoma.

Glaucoma is typically characterized by degenerative structural changes in retinal ganglion cells and leading to related visual field loss. As the disease progresses death of retinal ganglion cells occurred which leads to permanent glaucomatous visual field loss. Increase intraocular pressure is a modifiable risk factor to prevent further damage. (2)

Pseudoexfoliation syndrome is a systemic condition that primarily affects the anterior structures of the eye. Exfoliative material accumulates in organs other than the anterior structures of the eye, such as the heart, blood vessels, lungs, and meninges. The exfoliative material is primarily made up of abnormally cross-linked fibrils. The exact pathophysiology underlying the development and progressive extracellular accumulation of exfoliative material is unknown, but genetic and environmental factors are thought to be involved. Pseudoexfoliation is usually bilateral with an asymmetric presentation in the eyes, which can cause severe visual loss or blindness due to glaucoma or cataract. (3)

Pseudoexfoliation syndrome is frequently associated with open angle glaucoma, known as pseudoexfoliation glaucoma, which is the most common identifiable form of secondary open angle glaucoma worldwide. (4)

Pseudoexfoliation glaucoma can progress more rapidly than primary open angle glaucoma. Nuclear cataracts develop earlier in pseudoexfoliation patients than in the general population. It includes a 5-10 fold increase in the risk of surgical complications due to poor pupil dilation and increased zonular instability. (3)

MATERIAL AND METHOD:

This observational, cross sectional clinical study was conducted at a tertiary eye care hospital from December 2020 to December 2022. The study aimed to evaluate the relation between ocular pseudo exfoliation and open angle glaucoma.

The study include 117 eyes of 77 patients s diagnosed with ocular pseudoexfoliation visiting outpatient department of tertiary eye care centre and who were above 40 years of age All patients having ocular co-morbidities and other causes of secondary glaucoma were excluded.

All the necessary details of each patient were obtained from the available data eg. Detailed history, visual acuity, slit lamp examination ,measurement of intraocular pressure, pachymetry , gonioscopy ,visual field analysis cup-disc ratio evaluation.

Glaucomatous optic neuropathy were classified according to Canadian guidelines:(5)

Mild: Cup disc ratio < 0.65 or mild visual field defect not within 10 degrees of fixation

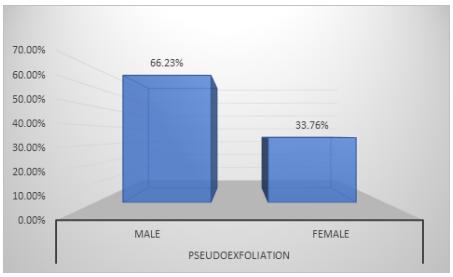
Moderate: Cup disc ratio 0.7 to 0.85 or visual field defect not within 10 degree of fixation or both

Severe: Cup disc ratio >0.9 or visual field defect within 10 degree of fixation or both

Proportions were calculated for discrete data while the mean was obtained for continuous data.

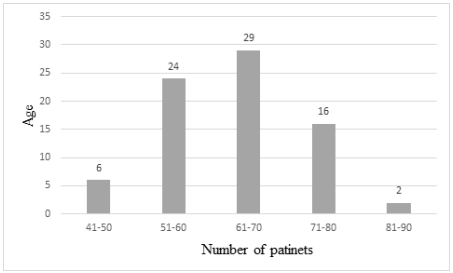
RESULT:

- We observed that out of 77 patients 51(66.23%) patients were male and 26(33.76%) patients were females. [graph 1]



Graph no. 1: Gender distribution of pseudoexfoliative patients

- In this study out of 77 patients, 6(7.79%) patients were in age group of 41-50 years of age, 24(31.16%) patients were in between 51-60 years of age, 29(37.66%) patients were in between 61-70 years, 16(20.77%) patients were in between 71-80 years and 2(2.59%) patients were in between 81-90 years of age.[graph 2]



Graph no. 2: Age distribution

This study shows 40(51.94%) patients had bilateral pseudoexfoliation and 37(48.05%) patients had unilateral pseudoexfoliation.

A) In this study we observed that out of 40 patients who had bilateral pseudoexfoliation, 17 (42.5%) patients were diagnosed with bilateral glaucoma, 15(37.5%) patients did not have glaucoma whereas 8(20%) patients were diagnosed with unilateral glaucoma.[table 1]

Table no. 1: Frequency of glaucoma in bilateral pseudoexfoliation patients

Bilateral pseudoexfoliation	Frequency	Percent (%)
Bilateral glaucoma	17	42.5
Unilateral glaucoma	8	20
No glaucoma	15	37.5

B) In our study we observed that 37 patients who had unilateral PEX, 22(59.45%) patients were diagnosed with glaucoma and 15(40.54%) patients did not have glaucoma.[table 2]

Table no. 2: Frequency of glaucoma in unilateral pseudoexfoliation

Glaucoma	Frequency	Percent (%)
Present	22	59.45
Absent	15	40.54

- Out of 117 eyes of 77 patients, 64(54.70%) had glaucoma and 53(45.29%) did not have glaucoma. [table 3]

Table No. 3: Percentage of open angle glaucoma in pseudoexfoliation patients

Glaucoma	Frequency	Percent (%)
Present	64	54.70%
Absent	53	45.29%

- 64 eyes that had glaucoma were classified according to cup disc ratio, which shows that 10(15.62%) eyes had mild disc changes, 23(35.93%) eyes had moderate disc changes, whereas maximum 25(39.06%) eyes had severe disc changes in cup disc ratio.[table 4]

Table no. 4: Distribution according to optic disc neuropathy

Cup disc ratio	Frequency	Percent (%)
Mild	10	15.62
Moderate	23	35.93
Severe	25	39.06
Media opacity	6	9.37

- Out of 64 eyes having glaucoma, majority eyes were affected with severe changes in visual field.[table 5]

Table no. 5: Distribution according to visual field

Visual field	Frequency	Percent (%)
Early defect	3	4.68
Moderate defect	6	9.37
Severe defect	35	54.68
Low reliable	19	29.68
Within normal limit	1	1.5

- Among 76 eyes having capsular PEX, 37(48.68%) eyes had glaucoma. Out of the eyes having pupillary PEX which were 37, 24(64.86%) eyes has glaucoma. Where as out of 3 eyes having both capsular and pupillary PEX, 2(66.66%) eyes had glaucoma. One eye which showed only gonioscopic PEX had 100% relation with glaucoma.

DISCUSSION

Our study aims at finding the number of patients having glaucoma in patients diagnosed with ocular pseudoexfoliation. Not many studies have been carried out regarding this in western India. This study shows the number of patients of PEX having glaucoma in tertiary eye care centre in western India. By doing this study we had found that PEX has a relation with open angle glaucoma, so glaucoma workup of patients having PEX can prevent glaucoma related blindness.

Gender distribution:

In our study there was male preponderance. Out of 77 patients having PEX, 51 (66.23%) patients were male and 26 (33.76%) were female.

A study conducted in south India in 2017 also found that out of 96 patients of PEX 55(57%) were male and 41(43%) were females.(6).

Tarek A Shazly, Abdelsattar N Farrag *et al*(5) in 2011 also found that out of 320 patients of PEX 188(58.75%) were male and 132(41.25%) were female.

Age distribution

In our study we found that maximum patients 37.66% were between age group of 61-70 years of age. And the mean age was found to be 64.43 year.

A study conducted in Egypt, in 2011, also found that mean age of PEX patients was 68.15 years. They also found 90% of patients were above 60 years of age.(4)

Distribution according to laterality

In our study there were 37(48.05%) patients who had unilateral PEX whereas 40(51.94%) patients had bilateral PEX. Out of patients having bilateral PEX, 17(42.5%) had bilateral glaucoma, 8(20%) had unilateral glaucoma and 15(37.5%) had no glaucoma. Also from the patients having unilateral PEX 22(59.45%) had glaucoma and 15(40.54%) did not have glaucomatous changes.

Shazly *et al*(5) found that 82.2% had bilateral PEX and 17.8%

had unilateral PEX.

Hisham jammal *et al*(7), conducted retrospective study between 2015-2018 also found that 56% had unilateral PEX and 44% had bilateral PEX.

Assessment of severity of disc changes

In our study we observed that out of 64 patients having glaucoma, 10(15.62%) had mild disc changes, 23(35.93%) had moderate disc changes, whereas 25(39.06%) had severe disc changes. This showed that majority patients of PEX that developed glaucoma had severe disc changes.

However a study published in 2016 Gnanaselvan Joseph, Anbuselvi Thirunavukkarasu found that 71% patients has moderate glaucomatous damage(Cup disc ratio 0.6-0.8) and 22% having severe glaucomatous damage(Cup disc ratio >0.8).(8)

Assessment of visual field

We observed that 35(54.68%) patients had severe field defect where as only 6(9.37%) had moderate field defect.

Similar to this study, Gnanaselvan Joseph, Anbuselvi Thirunavukkarasu observed in their study in 2016 that 33% had moderate defect and 9% had severe field defect.(8)

Pseudoexfoliation and open angle glaucoma

In our study we observed that out of 117 eyes of 77 patients, 64(54.70%) eyes were diagnosed with glaucoma whereas 53(45.29%) eyes did not have glaucomatous changes.

A study conducted in south India, published by Indian journal of clinical and experimental ophthalmology in October-December 2016, included 96 patients with pseudoexfoliation observed that 34(35%) patients diagnosed with glaucoma.(8)
A retrospective study conducted in Jordan University Hospital between January 2015 and March 2018 observed that out of 962 patients of PEX, 237(25.4%) patients were diagnosed with pseudoexfoliation glaucoma.(7)

In 2017 a study conducted by Balasubramanian M. Manickavelu, Anuradha P. Padmanabhan in south India, out of 96 patients of PEX 35(36%) patients were diagnosed with glaucoma.(6)

CONCLUSION

This study confirms that there is a definite relation between pseudoexfoliation and open angle glaucoma. The patients of pseudoexfoliation who had both pupillary and angle involvement showed highest occurrence of glaucoma followed by patients with pupillary pseudoexfoliation alone.

Hence careful eye examination of people having pseudoexfoliation is mandatory for early diagnosis and treatment of glaucoma which can prevent glaucoma related visual loss.

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