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Original research article

A study on clinical profile of cataract patients with pseudoexfoliation

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Abstract

"Pseudoexfoliation syndrome (PEX) is defined as a clinically important systemic condition characterized by the pathological production and accumulation of an abnormal fibrillary extracellular material on the anterior lens capsule, zonules, ciliary body, pupillary margins of the iris, corneal endothelium, anterior vitreous and trabecular meshwork, and extra-ocular tissues which includes skin, lung, myocardium, liver, gall bladder, kidney, and meninges". A Prospective study was conducted in the department of ophthalmology among 50 patients diagnosed with PXF with Cataract and 50 age matched cataract without PXF patients posted for cataract surgery were chosen. Among 100 patients included in our study, 74% had senile immature cataract, 18% had Senile mature cataract and 8% had senile hyper mature cataract. The most common type of cataract was senile immature cataract.

Keywords: Cataract, Pseudoexfoliation, Senile Mature Cataract

Introduction

The corneal endothelium do not regenerate after any insult due to drugs, trauma, chemical injury, any surgical procedures, contact lens use, or due to metabolic stress. The repair is by enlargement and spreading of the corneal endothelial cells to create a layer of cells on the inner surface of the cornea. The degree of loss from any of the above can be documented with specular microscopy as an increase in the endothelial cell surface area and a decrease in the endothelial cell density of the cornea [1].

The endothelial repair is reflected in an increase in the variation of the individual cell areas i.e., Polymegathism or coefficient of variation(CV).The polygonal with six-sided are indication of an even distribution of the membrane surface tension and of normal cells and has the greatest surface area relative to its perimeter is the Hexagon. The healthy cornea can be expected to have 60% of the cells as hexagons. The stress to endothelial cells will result in the decrease of the percentage of hexagonal cells [2].

"Pseudoexfoliation syndrome (PEX) is defined as a clinically important systemic condition characterized by the pathological production and accumulation of an abnormal fibrillary extracellular material on the anterior lens capsule, zonules, ciliary body, pupillary margins of the iris, corneal endothelium, anterior vitreous and trabecular meshwork, and extra-ocular tissues which includes skin, lung, myocardium, liver, gall bladder, kidney, and meninges". PXS and PXG have been associated with mutations in LOXL1 gene (15q24) which codes for elastic fiber components of extracellular matrix [3].

Clinically, the PXF material can be seen deposited on the anterior lens capsule has three distinct zones, a translucent central disc, a clear zone probably corresponding to contact with the moving iris, and a peripheral granular zone. The central zone is absent in 20% of cases or more, but the peripheral zone is a consistent findings seen on dilated pupil [4].

The ultrastructural appearance of exfoliation syndrome is that of random 10 to 12 nm fibrils, arranged in a fibrillogranular matrix and occasionally coiled as spirals. Evidence supports the concept that exfoliation is an inherited microfibrillopathy involving transforming growth factor-1, oxidative stress, and impaired cellular protection mechanisms as key pathogenetic factors.

Methodology

A Prospective study was conducted in the department of ophthalmology among 50 patients diagnosed with PXF with Cataract and 50 age matched cataract without PXF patients posted for cataract surgery were chosen.

The study was approved by the institute research and ethical committee and written informed consent was obtained from each patient after explanation of nature of the study.

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Sample size
50 eyes of 50 cataract patients with pseudoexfoliation
50 eyes of 50 cataract patients without pseudoexfoliation

Inclusion criteria
- Patients with senile cataract
- Patients with senile cataract with pseudoexfoliation
- Patients willing to give written informed consent for the study

Exclusion criteria
- Patients not willing to give written informed consent
- Traumatic, congenital, developmental and complicated cataract
- Eyes with corneal pathology
- Dry eye syndrome
- H/O ocular surgery

Preoperatively
Preoperative evaluation of all patients was carried out in which a detailed history was taken followed by systemic and ocular examination.
- The details of the patient's name, age, sex, address and occupation was noted.
- A detailed medical and ophthalmic history was elicited
- Best corrected visual acuity using Snellen's chart was recorded
- Anterior segment evaluation by slit lamp biomicroscopy was done
- Pseudoexfoliation material noted for its presence on the pupillary margin, and on the lens capsule in both eyes.
- lacrimal syringing was done
- Intraocular lens power calculation was done
- Posterior segment evaluation done
- Gonioscopy done under topical anesthesia (4% xylocaine) with a hand held four mirror indirect gonioscope.

The following points were specifically evaluated.
- The presence of excessive pigments in the trabecular meshwork.
- The presence of pseudoexfoliation material in the angle.
- The presence of Sampolesi's line.

Results

Table 1: Distribution of patients based on gender

Sex	Frequency	Percentage
Male	44	44
Female	56	56
Total	100	100

This table depicts the gender distribution of patients in our study, in which44% were males and 56% were females.

Table 2: Distribution of patients based on age

Age in Years	Male	Female	Total
50 to 59	11	17	28
60 to 69	16	26	42
70 to 79	17	6	23
80 and Above	0	7	7
Total	44	56	100

This table shows the age wise distribution of patients included in the study. The majority of the subjects were in the age group of 60 to 69 years. Minimum age being 50 and maximum was 86.

ISSN:0975 -3583,0976-2833 VOL13, ISSUE 05, 2022

Table 3: Distribution of patients based on age in each group

Age in Years	Patients with PXF	Patients without PXF
50 to 59	11	17
60 to 69	22	20
70 to 79	14	9
80 and Above	3	4
Total	50	50

This table shows the age wise distribution of patients in each group in the study, in which the majority of the subjects were in the age group of 60 to 69 years.

Table 4: Distribution of patients according to laterality

Eye	Frequency	Percentage
Right eye	59	59
Left Eye	41	41
Total	100	100

This table shows the Distribution of Patients according to Laterality. 59% had right eye cataract and 41% had Left eye cataract with and without PXF.

Table 5: Distribution of patients according to the type of cataract

Type of cataract	Frequency	Percentage
SHMC	8	8
SIMC	18	18
SMC	74	74
TOTAL	100	100

The above table depicts that among 100 patients included in our study, 74% had senile immature cataract, 18% had Senile mature cataract and 8% had senile hyper mature cataract. The most common type of cataract was senile immature cataract.

Table 6: Distribution of patients according to systemic association

Systemic Illness	Frequency	Percent
DM	11	11.0
DM,HTN	6	6.0
HTN	9	9.0
HTN,BA	1	1.0
IHD	1	1.0
NIL	72	72.0
Total	100	100.0

The above table depicts that among 100 patients included in this study, 11% patients had diabetes mellitus, 6% patients had both diabetic and hypertension, 9% patients had hypertension, 1% had HTN and BA, 1% had IHD and 71% were Nil systemic.

Table 7: Distribution of diabetic patients in each group

	PTS with PXF	PTS without PXF	Total
DM	10	07	17

The table shows distribution of diabetic patients in each group in the study, in which 10 patients were diabetic in patients with Pseudoexfoliation 7 patients were diabetic in control group.

Discussion

The corneal endothelium is monolayer of cells which plays an important role in maintenance of corneal hydration. The endothelium of cornea does not regenerate after any insult or the injury in human being. Any loss of the endothelium is compensated by enlargement of the cells there by compromising on the function of endothelium [5].

Pseudoexfoliation syndrome is a systemic disorder which is a result of abnormal metabolic changes in cell leading to accumulation of fibrillary material in anterior segment of the eye and other organs. Risk of

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endothelial decompensation is more in patients with Pseudoexfoliation.
We used specular microscopy to compare ECD and in cataract patients with PXF and in the control group.
In our study, The majority of the subjects were in the age group of 60 to 69 years. Minimum age being 50 and maximum was 86.The results are consistent with the studies presented by G D. Sturrock, *et al*. [6]
The endothelial cell count was significantly lower in patient with Pseudoexfoliation in the age group of 80 and above. There is a significantly decrease in mean endothelial cell count with increasing age which shows there is a gradual reduction of cell number with increasing age [7].
Among 100 patients included in our study, 74% had senile immature cataract, 18% had Senile mature cataract and 8% had senile hyper mature cataract. The most common type of cataract was senile immature cataract.
Among 100 patients included in this study, 11% patients had diabetes mellitus, 6% patients had both diabetic and hypertension, 9% patients had hypertension, 1% had HTN and BA, 1% had IHD and 71% were Nil systemic. Patients with diabetes mellitus had less endothelial cell count as compared to patients without diabetes mellitus the results were consistent with the studies presented by Modis L Jr *et al*. [8] there was a statistically significant decreased endothelial cell density in patients with diabetes mellitus (2375.88±503.303 cell/mm^2) in comparison with healthy subjects (2450.76±371.124 cell/mm^2).

Conclusion

- The majority of subjects were in the age group of 60 to 69 years minimum age being 50 and maximum was 86.
- Among 100 patients 74% had SIMC 18% had SMC, 8% had SHMC.

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