Original Article

Post Cataract Surgery Incidence of Dry Eye Disease: An Experience from a Tertiary Care Hospital of South Punjab

Post Cataract Surgery of Dry Eye

Nadia Nazir, Zulfiqar Ali and Soufia Farrukh

ABSTRACT

Objective: To find out the incidence of dry eye among patients who underwent cataract surgery.
Study Design: Prospective observational study.
Place and Duration of Study: This study was conducted at the Department of Ophthalmology, Bahawal Victoria Hospital, Bahawalpur for a period of six months from January 2020 to June 2020.
Materials and Methods: A total of 136 patients, having visually significant cataract and listed for cataract surgery, aged 40-80 years, were enrolled for this study. Ocular examination including "slit lamp examination" was done among all enrolled patients for ruling out any possible ocular surface disorders. Dry eye was labeled with "Schirmer's strip" test after 5 minutes the filter paper is removed and the amount of wetting from the fold measured. Less than 10 mm of wetting after 5 minutes without anesthesia and less than 6 mm with anesthesia is considered abnormal. Gender, age, area of residence, and type of surgery was noted for all patients. All patients data was analyzed at 1-month and 3-months follow-up.
Results: Out of a total of 136 patients, 74 (54.5%) were male and 62 (45.6%) were female. Majority of the patients, 118 (86.8%) aged above 50 years. There were 85 (62.5%) patients who belonged to rural areas. Phacoemulsification was the commonest type of surgery performed in 124 (91.2%) patients. There were 24 (17.6%) patients who reported dry eyes at 1-month follow up while at the end of 3-months period, 26 (19.1%) were having dry eye disease. No significant difference was noted in characteristics of patients with regards to presence of dry eye disease ($P>0.05$).
Conclusion: Incidence of dry eye following cataract surgery was high. Characteristics of the patients or the types of cataract surgery did not seem to influence occurrence of dry eye. Further studies adopting prospective designs with long follow ups involving patients undergoing cataract surgery are needed to further enlighten us regarding different aspects of commonly occurring complications like dry eye.
Key Words: Cataract, dry eye, schirmer test, phacoemulcification, SICS (small incision cataract surgery).

Citation of article: Nazir N, Ali Z, Farrukh S. Post Cataract Surgery Incidence of Dry Eye Disease: An Experience from a Tertiary Care Hospital of South Punjab. Med Forum 2021;32(1):51-54.

INTRODUCTION

Cataract surgery generally results in good visual outcomes.[1] Some researchers have noted occurrence of dry eye among patients who underwent cataract surgery.[2,3] Dry eye is considered to be a multifactorial disorders related to tear-film and the ocular surface usually resulting as discomfort, visual disturbances and tear film instability, and might go on to harm ocular surface.[4]

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Received: October, 2020
Accepted: December, 2020
Printed: January, 2021

Possible reason for the occurrence of dry eye after cataract surgery could be because of alterations in the ocular surface due to surgical trauma and post-surgery inflammation. As we know, cataract surgery is quite common but not many studies exist evaluating occurrence of dry dye following cataract surgery in our part of the world. Let alone documentation of the incidence of dry eye following cataract surgery, most commonly occurring symptoms of dry eye are not usually recorded. Many cases following cataract surgery have complaints of foreign body sensations, irritation, redness and blurring of vision which are undesired effects of the cataract surgery.[5] These symptoms are more pronounced among elderly patients while some patients may have persistence of these symptoms which could go on to result in dry eye disorder which require treatment. Due to these reasons, even if a patient had very good cataract surgery with "Snellen's Visual Acuity", might remain unsatisfied.[6]

Dry eye disorder after cataract surgery can hamper functional recovery so it is vital to find out the incidence of dry eye following cataract surgery along with possible factors responsible for dry eye in these

patients. Kasetsuwan N et al[7] found incidence of dry eye following cataract surgery to be 9.8% while Venugopal KC et al[8] noted that to be 66.2%. So huge variation exist regarding incidence of dry eye disease following cataract surgery. In Pakistan, no study has been done to find out existence of dry eye following cataract surgery so this study was aimed at providing us assistance estimating the incidence along with possible factors responsible for dry eye following cataract surgery. The objective of this study was to find out the incidence of dry eye among patients who underwent cataract surgery.

MATERIALS AND METHODS

This prospective study was done at Department of Ophthalmology, Bahawal Victoria Hospital, Bahawalpur from January 2020 to June 2020. Approval from institutional ethical board was sought and written consent was taken from all study participants.

A sample size of 136 patients was calculated through formula: n = z2 * p * (1 - p) / e2, wherez = 1.96 for a confidence level (α) of 95%, p = 9.8% and e = 0.05. A total of 136 patients visiting outpatient department of Ophthalmology, Bahawal Victoria Hospital, Bahawalpur, having visually significant cataract and listed for cataract surgery, aged 40-80 years, were enrolled for this study. Patients having dry eyes characterized by Schirmer's test value <10mm, Sjogren's syndrome or presence of any ocular disorder like glaucoma, uveitis, lid disease and nasolacrimal pathway, ocular allergies, pterygium or history of ocular surgery were not enrolled. Patients losing follow up were also excluded. Ocular examination including "slit lamp examination" was done among all enrolled patients for ruling out any possible ocular surface disorders.

Dry eye was labeled when there was "Schirmer's strip" wetting at the end of 5 minutes (basal and reflex). "Schirmer's test" was conducted before surgery, 1-month and 3 months post-surgery in the operated eye. "Schirmer's test" value < 10mm was termed as dry eye. Dry eye was further labeled as mild (Schirmer's test value=7-9mm), moderate (Schirmer's test value=5-7mm) or severe (Schirmer's test value less than 5mm).[9]

All study data was entered in a pre-designed proforma specifically designed for this study and analyzed using SPSS Version 26.0. Gender, age, pre-surgery and post-surgery vision and type of surgery was noted for all patients. All patients data was analyzed at 1-month and 3-months follow-up. Chi-square test was used to test statistical significance considering p value < 0.05 as statistically significant.

RESULTS

Out of a total of 136 patients, 74 (54.5%) were male. Majority of the patients, 118 (86.8%) aged above 50 years. There were 85 (62.5%) patients who belonged to rural areas. Phacoemulsification was the commonest type of surgery performed in 124 (91.2%) patients. Table 1 is showing characteristics of the patients.

Table No.1: Characteristics of the Patients (n=136)

Characteristics		Number (%)
Gender	Male	74 (54.4%)
	Female	62 (45.6%)
Age	≤50 Years	18 (13.2%)
	>50 Years	118 (86.8%)
Area of Residence	Urban	51 (37.5%)
	Rural	85 (62.5%)
Type of Surgery	Phacoemulsification	124 (91.2%)
	Small Incisional Cataract Surgery	8 (5.9%)
	Extracapsular Cataract Surgery	4 (2.9%)

Table 2 is showing incidence and types of severity among patients of dry eyes post cataract surgery at 1-month and 3-months period. There were 24 (17.6%) patients who reported dry eyes at 1-month follow up while at the end of 3-months period, 26 (19.1%) were having dry eye disease. At 1-month post-cataract surgery follow up, most of the patients with dry eyes were having mild dry eye disease (n=19/24, 79.2%) while at 3-months follow up, moderate dry eye disease was the commonest among patients having post-cataract surgery dry eye disease (n=18/26, 69.2%).

Table No.2: Post Cataract Surgery Incidence and Severity of Dry Eyes

Dry Eyes		At 1-Month (n=24)	At-3 Months (n=26)
Severity	Mild	19 (79.2%)	6 (23.1%)
	Moderate	2 (8.3%)	18 (69.2%)
	Severe	3 (12.5%)	2 (7.7%)

Table 3 is showing comparison of patients having dry eyes or no dry eyes. No significant difference was noted in characteristics of patients with regards to presence of dry eye disease (P>0.05).

Table No.3: Distribution of Dry Eye with Regards to Characteristics of the Patients at 3-Months Follow up

Characteristics		Dry Eye (n=26)	No Dry Eye (n=110)	P-Value
Gender	Male	15 (57.7%)	59 (53.6%)	0.708
	Female	11 (42.3%)	51 (46.4%)	8
Age	≤50 Years	2 (7.7%)	16 (14.5%)	0.353
	>50 Years	24 (92.3%)	94 (85.5%)	7
Area of Residence	Urban	8(30.8%)	43(39.1%)	0.430
	Rural	18 (69.2%)	67 (60.9%)	5
Type of Surgery	Phacoemulsification	23 (88.5%)	101 (91.8%)	0.863 1
	Small Incisional Cataract Surgery	2 (7.7%)	6 (5.5%)	
	Extracap-sular Cataract Surgery	1 (3.8%)	3(2.7%)	

DISCUSSION

Cataract surgery is considered to be one of the most commonly performed procedures. Like many other procedures, cataract surgery is not free from post-surgery complications like inflammatory reaction, rise in intraocular pressure, cystoid macular oedema and post-operative astigmatism.[10] Dry eye symptoms are also commonly observed among patients following cataract surgery but not documented generally.

In the present study, we found post-cataract surgery incidence of dry eye as 17.6% at 1-month follow up and 19.1% at 3-months follow up. Post-cataract surgery incidence of dry eye is found to have huge variation (9.8-96.6%).[7,10,11] This high variability could be attributed to factors like type of surgery (SICS or phacoemulsification), types of ophthalmic solutions utilized, intra-operative and post-operative drugs, coexistence of systemic diseases, operating microscope exposure duration, cumulative dissipated energy (CDE) during phacoemulsification the time following surgery. We found that characteristics of patients did not influence the existence of dry eye but some researchers have pointed out that type of cataract surgery seem to influence incidence of dry eye disease. In the present study, 91.2% patients underwent phacoemulsification. Kasetsuwan N et al[7] noted incidence of dry eye as 9.8% among patients undergoing phacoemulsification while Venugopal KC and colleagues[8] revealed the incidence of dry eye as 66.2% among patients undergoing manual small incision cataract surgery. Variation in the incidence of dry eye following cataract surgeries can also be attributed to variation in various criteria adopted aiming diagnosis of dry eyes. Khadke A et al[9] from India adopting Schirmer's test for the diagnosis of dry eyes found incidence of dry eyes as 14.87% at post-cataract surgery 3-months follow up period which is quite close to what was found in the present research.

Dodia K et al[12] noted post phacoemulsification cataract surgery to be significantly linked with age (more than 65 years) but we did not find any significant association of age and post-cataract surgery dry eye in our set of patients. Significant association between age and post-cataract surgery dry eye, noted by some researchers, could be incidental as both cataract and dry eye disorders are age related.[12]Although, we did not note any significant association between dry eye disease and gender in the present study but some researchers have found significant linkage between female gender and presence of dry eye.[13,14] Association between dry eye disorder and post-menopausal women is well established in the past.[15,16]

The present study had some limitations as well. We were unable to correlate visual acuity with the presence of dry eyes. We did not record microscope exposure time and its association with the presence of dry eye. Sample size of this study was comparatively short so our findings cannot be generalized.

CONCLUSION

Incidence of dry eye following cataract surgery was high. Characteristics of the patients or the types of cataract surgery did not seem to influence occurrence of dry eye. Further studies adopting prospective designs with long follow ups involving patients undergoing cataract surgery are needed to further enlighten us regarding different aspects of commonly occurring complications like dry eye.

Acknowledgement: The authors are thankful to Muhammad Aamir (Research Consultant, Bahawalpur) for his volunteer assistance in statistical analysis of this research.

Author's Contribution:

Concept & Design of Study:	Nadia Nazir
Drafting:	Zulfiqar Ali
Data Analysis:	Soufia Farrukh
Revisiting Critically:	Nadia Nazir, Zulfiqar Ali
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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