

Study of Dry Eye after Manual Small Incision Cataract Surgery**Hema Sai G¹, Prema Latha G², Viswa Bharathi P³, V. Sheela Deep⁴**¹2nd Year Post Graduate, Andhra Medical College²Associate Professor, Department of Ophthalmology, Andhra Medical College / Government Regional Eye Hospital³Assistant Professor, Department of Ophthalmology, Andhra Medical College / Government Regional Eye Hospital⁴Assistant professor, Department of Ophthalmology, Andhra Medical College / Government Regional Eye Hospital

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Conflict of interest: Nil

Abstract:**Aim:** To find occurrence of dry eye and to assess the severity of dry eye after manual small incision cataract surgery with cornea sclera tunnel incision.**Material and Methods:** A total of 100 patients were selected who came for manual small incision cataract surgery each patient was questioned preoperatively about dry eye symptoms and examined with schirmers test 1 and tear film break up time. Following this, the patients underwent small incision cataract surgery with a superior incision of 6-7mm depending on grade of cataract schirmers test 1 and tear film breakup time test were repeated on post operative day 1st, 7th and 30th day. Dryness of eye was analysed and graded as per DEWS CLASSIFICATION 2007.**Results:** Out of 100 samples, 26% had dry eye preoperatively which increased to 89% post operatively on 1st day out of these 89 patients having dry eye post operatively, 35 were male and 54 were female mean schirmers 1 value -16.78mm preoperatively after 1st day of surgery-7.03, 1week of surgery-7.15mm, 1month -10.45 mm. Difference of values between preoperative and postoperative are significant p less than 0.001. In TBUT STUDY-mean TBUT preoperatively was 17.89 sec and decreased to 7.24 sec at 1st post operative day and after 1week to 7.84 sec after a month increased to 13.23 seconds.**Keywords:** Dry Eye, Manual Small Incision Cataract Surgery, Schirmers Test.

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Introduction**Cataract:** Any opacity in the lens or its capsule whether congenital, developmental or acquired which causes visual impairment for which MSICS - manual small incision cataract surgery is most routinely performed [1] Many patients have reported of dry eye and post-operative pain symptoms following surgery [1,2]

In addition, the use of topical eye drops, reduced corneal sensitivity, surgical inflammation due to large incision created in the eye and exposure to light from microscope during surgery are considered to be responsible for post-operative dysfunction of the tear film [3] This study analyses changes in tear film and production of tears after cataract surgery

Aim: To establish the incidence of dry eye in patients after manual small incision cataract surgery**Objectives:** To assess severity of dry eye in patients after manual small incision cataract surgery**Materials and Methods****Study design:** Cross sectional prospective study**Study setting:** Department of ophthalmology, Andhra medical college, government regional eye hospital, Visakhapatnam.**Study period:** 3 months**Study population:** patients with cataract attending ophthalmic in-patient services**Sample Size:** 100 patients

Informed consent obtained from all subjects after the nature and possible consequences explained to them

Inclusion Criteria

- Patients willing to participate
- Age group-55 to 80 years
- Patients with senile cataract with or without dry eye symptoms

Exclusion Criteria

- Cataract other than senile cataract
- Patients with other ocular, systemic co morbidities
- History of contact lens use
- Patients with constant ocular medications
- Patients who have had previous ocular surgeries

Methodology:

- Demographic details of the patients were collected
- 100 patients who met inclusion criteria were enlisted for cataract surgery
- Every patient was asked about symptoms related to dry eye and then they underwent Schirmer’s test 1 and tear film breakup time test(TFBUT)
- Preoperative dry eye-related data.
- Tear film function was assessed by Schirmer test-1 (ST-1) and tear film break-up time (TBUT).

Schirmer’s Test-1

- Wetting of the Schirmer’s strip ≤ 10 mm was considered dry eye and these patients were excluded from the study. ST-1 was performed only once.

Tear film break-up time:

- TBUT assessment was done and the readings were analyzed to assess the stability of the pre-corneal tear film – the mucin component of the tear film. The test was repeated three times, and the average was calculated. TBUT < 10 sec was indicative of dry eye. The time interval between ST-1 and TBUT was 10 min.
- After this, patients were subjected to surgery with a 6-7 mm superior incision
- On 1st, 7th and 30th day after surgery Schirmer’s and tear film breakup time test was again performed
- The dryness of the eyes was then analysed and graded in accordance with the 2007 DEWS classification

Statistical Analysis

- Microsoft excel was used in creating data base and producing graphs, while data analysis done using SPSS 26 and expressed in form of tables and histograms.
- A p value less than 0.05 was considered statistically significant.

Results

- Out of 100 samples, 26% had dry eye preoperatively which increased to 89% postoperatively on 1st day.
- Out of these 89 patients having dry eye postoperatively, 35 were male and 54 were female.

Table 1:

Grading	Percentage Pre-OP	Percentage Post OP
Mild	16%	25%
Moderate	8%	22%
Severe	2%	42%
Total	26%	89%

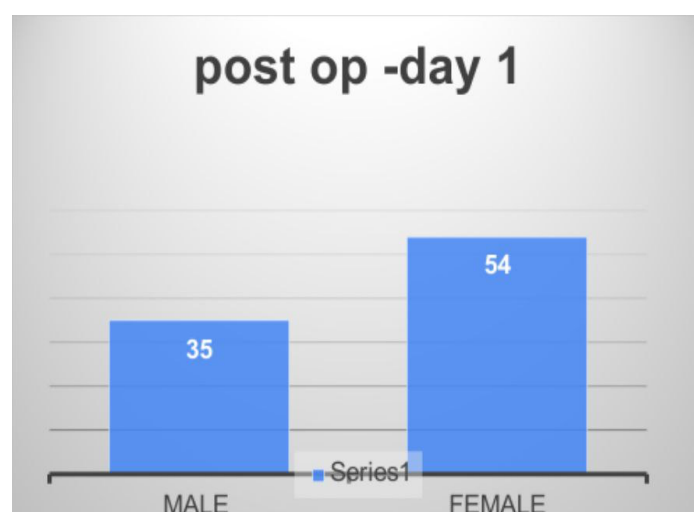


Figure 1: Post op day 1

The mean Schirmer’s 1 value - 16.78 mm preoperatively. After 1st day of surgery - 7.03, 1 week of surgery - 7.15mm, 1 month - 10.45mm. The difference of values between preoperative and post op are significant $p < 0.001$.

LINE GRAPH - SCHIRMERS TEST

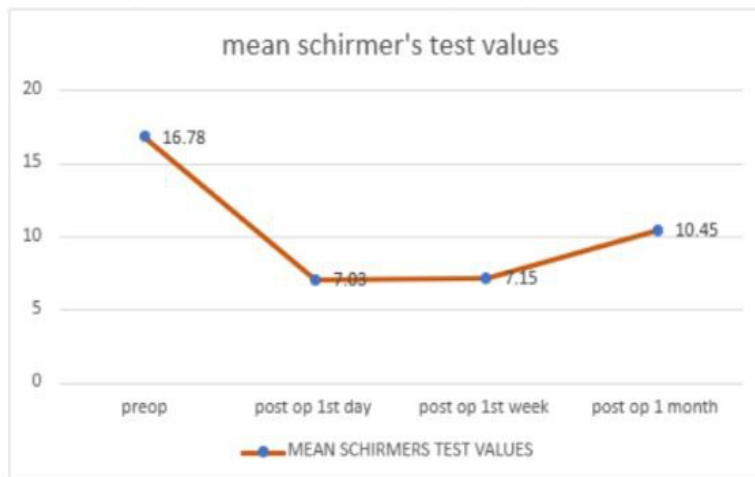


Figure 2: Line graph Schirmer test

In this study, Schirmer's 1 value

- >10 mm - Normal
- 8-10 mm - Mild
- 5-7 mm - Moderate
- < 5 mm - Severe

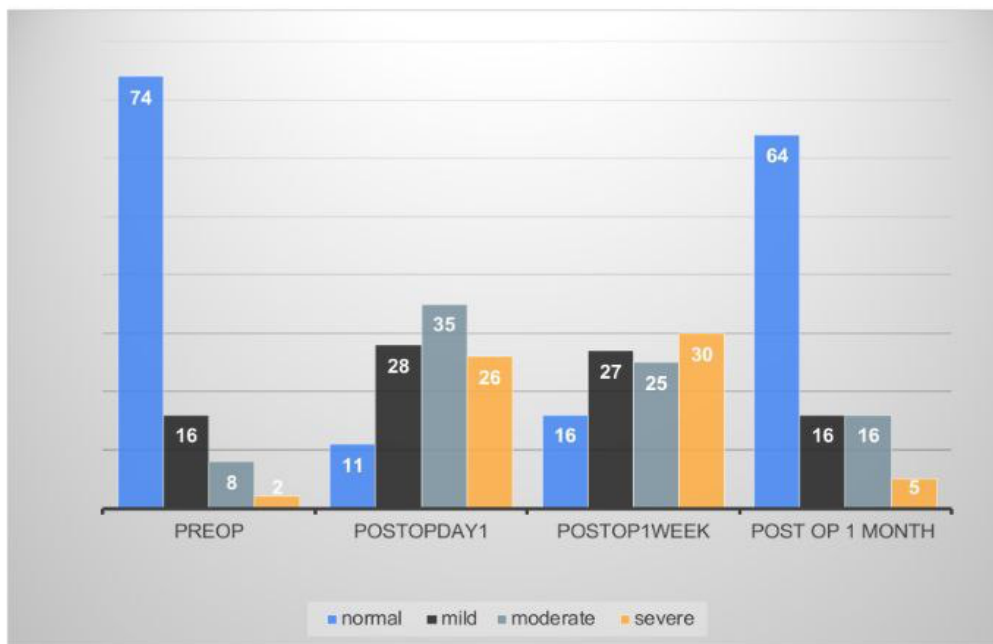


Figure 3:

In TBUT study, the mean TBUT preoperatively was 17.89 s and decreased to 7.24 s at 1st post-operative day and after 1 week to 7.84 s. After one month increased to 13.23 seconds

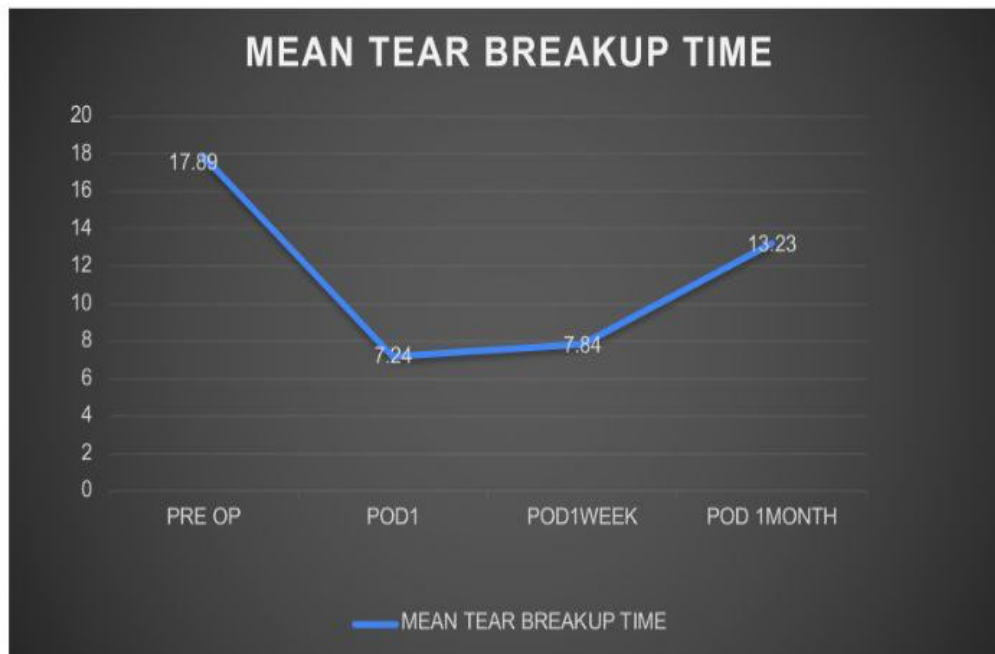


Figure 4: Mean tear breakup time

Discussion:

- In this study we assessed the dryness of eyes after SICS
- Damage to corneal and conjunctival epithelium due to chronic use of eye drops containing preservative like benzalkonium chloride (BAC) after cataract surgeries
- Ocular surface irregularity following surgery leads to faster breakage of tear film
- Decreased mucin production from conjunctiva destabilise tear film
- Decreased corneal sensation due to damage to long ciliary nerve and results in decreased tear secretion

Table 2:

Study	Venugop al K et al (2012)	Kasetsuw an n et al (2013)	Jayshree MP et al (2017)	Dodia k et al	Our Study
Sample Size	71	91	81	272	100
Preoperative Dryness	-	13	15	-	26
Reported Peak Incidence	1st week	1st day	1st week	1st day	1st day
Post Op Dryness 1st Week	43	72	78	136	89
Follow Up Done On (Days)	1,7,45 days	1,7,30,90 days		1,7,45 days	1,7,30 days
Mean Age (Years)	62	not mentioned	58.18	60.03	66.15
Sex	male	female	female	female	female

We observed that this improvement in dry eye syndrome could have been because of the use of a combination of antibiotic and dexamethasone (0.01%), carboxymethylcellulose in patients post-operatively

Limitation:

- Shorter follow up time may affect incidence in our Study
- A longer follow up might have added more insight into behaviour of post-operative dry eyes

- Major limitation of this study comparison between site and size of incision with degree of dryness was not done

Conclusion

Moderate to severe dryness of eyes was seen after SICS with corneoscleral tunnel which stabilizes after 1 month.

We recommend the use of preservative free lubricants, antibiotic and steroid combination

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