Original Research Paper

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Ophthalomology

OCULAR SURFACE AND TEAR FILM CHANGES AFTER MANUAL SMALL INCISION CATARACT SURGERY

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ABSTRACT **Introduction:** Manual Small Incision Cataract Surgery (MSICS) is widely performed in developing countries. However, it may induce or aggravate dry eye symptoms due to various ocular surface changes. **Methods:** This prospective observational study included 120 patients aged 45–70 years undergoing MSICS. Tear film indices (Schirmer's Test 1, Tear Break-Up Time, and Tear Meniscus Height) were evaluated preoperatively and postoperatively at 1 week, 1 month, and 3 months. **Results:** Preoperatively, 16.6% of patients had low Schirmer's test values, 15% had low TBUT, and 13.3% had low TMH. At 12 weeks post-surgery, these percentages increased to 25.8%, 23.3%, and 27.5%, respectively ($p<0.01$). **Discussion:** MSICS significantly worsens tear film indices and dry eye symptoms postoperatively, necessitating preoperative assessment and patient counseling. **Conclusion:** MSICS is associated with an increased incidence of dry eye syndrome, emphasizing the need for preoperative tear film evaluation.

KEYWORDS :

INTRODUCTION

Manual Small Incision Cataract Surgery (MSICS) remains the primary approach for cataract removal in resource-limited settings. However, postoperative dry eye symptoms such as foreign body sensation, ocular discomfort visual fatigue redness and watering are common.[1] SICS may affect the ocular surface by altering lid margin anatomy, reducing corneal sensation, and disrupting tear film stability.

Probable Etiopathology of Dry Eye After MSICS

- Reduced corneal sensation due to surgical incision disrupting the cornea-lacrimal gland loop.[2]
- Poor tear film stability caused by surgical inflammation.[3]
- Light exposure from the operating microscope affecting the ocular surface.[4]
- Prolonged use of antibiotic-steroid eye drops leading to goblet cell loss.
- Decreased meibomian gland function, reducing lipid layer thickness.

Aims and Objectives

To determine whether MSICS leads to changes in tear film stability and exacerbates dry eye symptoms postoperatively, stratified by age and gender.

MATERIALS AND METHODS

This is a Prospective observational study with sample size of 120 patients (age 45– 70 years). The Study Period was April 2022 to March 2023. Patients with adnexal, conjunctival, or corneal pathology; contact lens wearers; punctal occlusion; and systemic conditions like Sjögren's syndrome or thyroid ophthalmopathy were excluded from the study.

A comprehensive ocular adnexal examination was performed for each patient, assessing the anterior and posterior lid margins, eyelashes, blinking, punctum, and lacrimal passage patency. A thorough slit-lamp evaluation was conducted to detect any surface cellular damage, tear debris, meibomian gland openings, and other signs of inflammation.

The Tear Film Tests namely Tear Meniscus Height (TMH), Schirmer's Test 1 (ST1) and Tear Film Break-Up Time (TBUT) was performed in all the patients. Assessments was done first on day before surgery then 1 week post-operatively, 1 month postoperatively and in end 3 month postoperatively. Statistical analysis was performed using MS Excel and SPSSV23.

RESULTS

The study included 67 female and 53 male patients. The mean age was 60.5years.

Prior to operation 20 patients i.e 16.6% had low ST1 value (<10mm after 5min), suggestive of dry eye. 18 patients i.e 15% had TBUT<10 seconds. Also 16 patients had TMH <0.3 mm preoperatively.

At the end of our study period 31 (25.8%) patients had ST1 <10mm, 28(23.3%) had TBUT<10 seconds and 33(27.5%) had TMH <0.3 mm. These changes from preoperative finding were found to be statistically significant ($p < 0.01$). Peak deterioration of these tests was found at 12 week post operative period.

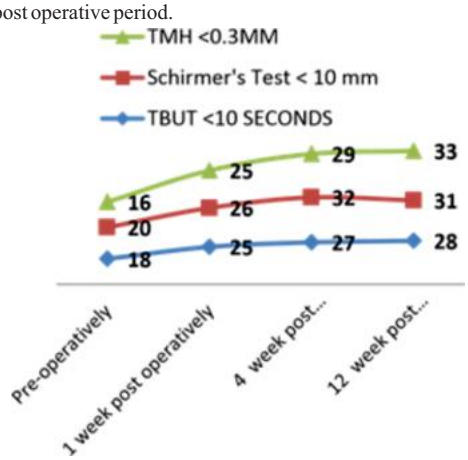

Figure 1- Comparison of Number of patients Having Lower than Critical Value of Tear Film Indices Over the Period of Observation.

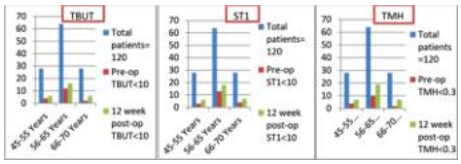

Figure 2- Age Wise Distribution of Patients with Abnormal Tear Film Indices TBUT, ST1 & TMH.

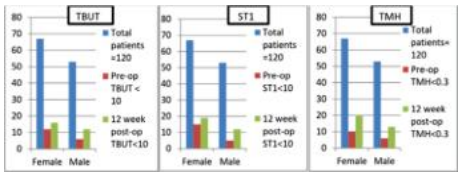

Figure 3- Gender Wise Distribution of Patients with Abnormal Tear Film Indices

DISCUSSION

Post-cataract surgery dry eye is a significant cause of patient dissatisfaction despite good visual acuity. Studies indicate greater worsening of dry eye indices in MSICS compared to phacoemulsification. Similar trends were observed in studies discussed below.

Ram et al, in 23 patients found deterioration in Schirmer's score and

TBUT values after cataract surgery. [1] Rajashekarreddy et al, found significant increase in dry eye symptoms with OSDI scoring and TBUT test after cataract surgery in a study of 123 patients including 87 SICS and 36 phacoemulsification.[5] Cho Y K et al, established significant aggravation of dry eye and deterioration of tear film indices in already diagnosed dry eye patients after cataract surgery. [4]

In our study of 120 patients progressive increase in count of patients with abnormal tear film indices was found.

CONCLUSION

This study confirms that MSICS contributes to postoperative dry eye syndrome, leading to a statistically significant decline in tear film stability. Preoperative tear film evaluation and patient counselling should be integrated into clinical practice to manage expectations and improve postoperative satisfaction.

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