



DIFFERENCES IN OCULAR SURFACE DISEASE INDEX SCORE IN PATIENTS BEFORE AND AFTER COMBINATION OF PHACOEMULSIFICATION AND TRABECULECTOMY

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ABSTRACT

Background: Dry eye is a disturbance on the surface of the eyeball marked by the loss of tear layer homeostasis, which can occur due to the instability and hyperosmolarity of tear film, inflammation or damage to the surface of the eyeball, and neurosensory abnormalities. Some surgical interventions related to the anterior part of the eye can cause symptoms of dry eye, one of which is facotrabeulectomy is a combination of surgical intervention performed in glaucoma patients with cataracts. One examination to evaluate the symptoms of dry eye is to use the Ocular Surface Disease Index (OSDI) questionnaire. **Objective:** This study aims to observe the difference in Ocular Surface Disease Index (OSDI) scores in patients before and after surgery combined with phacoemulsification and trabeculectomy. **Methods:** Analytic observational research with one group pretest and posttest research design. With a large sample of 18 respondents who were evaluated by the OSDI questionnaire in patients before and two weeks after facotrabeulectomy. Hypothesis testing with a paired T-test. **Results:** The results showed that before the surgery for facotrabeulectomy, the average OSDI score was 50.4628 ± 7.9429 . After two weeks postoperatively the results of the study showed the average OSDI score was 58.7972 ± 7.7155 . Hypothesis testing showed that OSDI scores before and after facotrabeulectomy surgery were significant differences ($p = 0.001 / p < 0.05$). **Conclusion:** There were significant differences in OSDI scores in patients before and after facotrabeulectomy surgery.

Keywords : *Facotrabeulectomy, Dry eye, OSDI*

INTRODUCTION

Dry eye is one of the most common causes of ocular morbidity, eye health problems that continue to develop and one of the conditions that is often found by eye care practitioners.¹ According to the International Dry eye Workshop (2007) dry eye or dry eye is a multifactorial disease that affects tears and surfaces of the eyeball due to decreased tear production or excessive tear evaporation with symptoms such as discomfort, visual acuity, and tears that can cause damage to the surface of the eyeball.²

The tear layer has a role important for the quality of sharp eyesight, lubrication, maintaining eye comfort, and protecting the outside of the eye, including the cornea and conjunctiva. It is estimated that 5 billion Americans over 50 years suffer from dry eye syndrome and 25% of them experiencing abnormalities on the surface of the eye.³

According to Guyton, as many as 25% of patients who visit the eye clinic complain of symptoms of dry eye, which makes this complaint a problem of eye health in the community.⁴ Although dry eye can occur in both men and women of all races and all ages, research results generally state that the risk of dry eye

is higher in women. The combination of prevalence data from various studies based on sex found dry eye rates in women around 3.23 million and men around 1.68 million.⁵ There are several causes and risk factors for dry eyes, including age, sex, diabetes mellitus, systemic hypertension, contact lens use, drugs such as antihistamines, anticholinergics, antidepressants, oral contraceptives, and topical eye drops containing preservatives and ocular diseases such as blepharitis, chronic conjunctivitis, meibomitis, and pterygium.⁶

Some surgical interventions related to the anterior part of the eye containing preservatives and ocular diseases such as blepharitis, chronic conjunctivitis, meibomitis, and pterygium. can also cause dry eyes and further aggravate symptoms in patients with preexisting dry eyes.⁷ After cataract surgery in the form of phacoemulsification, some patients feel postoperative eye discomfort and symptoms of dry eye, and most of them show dysfunction in the torn lining.⁸

According to the International Dry Eye Workshop (2007), the prevalence of dry eyes in Laser-assisted in Situ Keratomileusis (LASIK) in patients without a history of previous dry eye ranges from 0.25% to 48%. Based on Ikuko Toda's research on dry eye after



LASIK shows dry eyes that can last up to 6 months or more with an incidence of 20%. Post-LASIK dry eyes usually last for at least 1 month.⁹

Other studies such as conducted by Sarungullo et al (2016) regarding dry eye after phacoemulsification surgery, obtained as many as 117 research subjects, but those who met the inclusion criteria were 100 patients consisting of 52 men (52%) and women as many as 48 people (48%) by evaluating subjectively using OSDI scores found that the symptoms of dry eye were found in post-phacoemulsification patients.¹⁰

This research was carried out because it wanted to know that the combination of phacoemulsification and trabeculectomy surgery made the symptoms of dry eye worse or worse, because phacoemulsification and trabeculectomy combination surgery resulted in inflammation on the ocular surface affecting the lacrimal functional units that play a role in the tear flow regulation system, causing lacrimal functional unit dysfunction so as to allow the appearance of symptoms of dry eye or dry eye symptoms.¹¹

METHOD

This research has been carried out in patients with facotrabeulectomy surgery at the Eye Clinic Dr. Kariadi in August-October 2019. The type of research applied was observational analytic with one group pretest and posttest design. The study subjects were selected by consecutive sampling of 18 patients and were scheduled to participate in facotrabeulectomy surgery. Retrieval of data in the form of OSDI scores in patients before facotrabeulectomy surgery and two weeks after the facotrabeulectomy surgery in the Eye Clinic Dr. Kariadi coincides with the control patient returning.

RESULT

Descriptive analysis is done by looking at the frequency and distribution of data for each variable. Based on the data obtained from the sample, the characteristics of the research subjects are as follows:

Tabel 1. Characteristics of research subjects

Characteristics	n	%
Gender		
Male	4	22.22
Female	14	77.78
Age		
40 - 49	1	5.56
50 - 59	8	44.44
≥ 60 tahun	9	50
Glaucoma type		
PACG	11	61.11

Table 1 illustrates the characteristics of the study subjects 18 respondents who participated in this study. The majority of sex distribution in this study were women compared to men with consecutive percentages of 77.78% and 22.22%. The average age of the study subjects was 58 years with the majority aged over 60 years as many as 9 people (50%). After the data normality test is done and the results of the normal data distribution are obtained, then the Paired T-Test is continued.

The intervention test in this study aims to measure the difference in OSDI scores in patients before and after facotrabeulectomy surgery.

Table 2. Differences in OSDI scores before and after facotrabeulectomy surgery.

	Before Facotrabeulecto my Surgery Mean (SD)	After Facotrabeulectomy surgery Mean (SD)	P
OSDI Score	50,4628(7,9429)	58,7972(7,7155)	0.001*

*paired t-test

Based on the output table 6, the mean OSDI score after the facotrabeulectomy surgery was higher than before the operation, which was 58.7972 and 50.4628, respectively. With a significant difference test ($p = 0.001$).



DISCUSSION

The results of this study show that in general the characteristics of facotrabeculectomy surgery patients were found in the Polyclinic of RSUP Dr. Kariadi Semarang has an average age of 58 years and is found more at more than 60 years of age. The prevalence of glaucoma itself is known to increase with age.¹² Most glaucoma sufferers also often experience dry eye symptoms.¹³ In addition to vision loss, according to Erb et al's research some glaucoma patients will also experience dry eyes, it was reported that 52.6% of glaucoma patients also experiencing dry eyes.¹⁴ Besides, glaucoma and dry eyes have the same risk factors, namely old age, and female sex.

Another study by Schmier et al concluded that dry eyes were more common in glaucoma patients (16.5%) than in non-glaucoma patients (5.6%).¹⁵ In this study, the percentage of female subjects was greater than that of male subjects, respectively 77.78% and 22.22%. This is consistent with the study of Vajarant et al who concluded that women, especially those entering the postmenopausal period, have a higher risk of suffering from glaucoma and dry eyes due to hormonal changes.^{16,17} Likewise PACG is dominant in the elderly and sex. women.¹²

A study from Day et al of a population from Europe reported a prevalence of age-specific PACG of 0.02% for those aged 40-49 years, increasing to 0.95% for those aged 70 years and over. In the study of Suryani et al who examined the dry eye after cataract surgery using phacoemulsification technique, it was found that the percentage of women was greater than that of men, respectively 52% and 48%, with the age range of study subjects in the range of 54-77 years.⁵

Likewise, Younan et al reported that the prevalence of cataracts, as well as cataract operations, was found to be higher in women than men.¹⁸ The mean OSDI score after facotrabeculectomy surgery was higher than before surgery which was 58.7972 ± 7.7155 and 50.4628 ± 7.9429 . With a significant difference test ($p = 0.001$). Based on the results of statistical tests showed differences in OSDI scores before and after facotrabeculectomy surgery. This is similar to Cetinkaya et al who examined the incidence of dry eye after phacoemulsification to get OSDI

scores increased postoperatively but returned to initial values after 3 months postoperatively.¹⁹

A study by Sitompul et al concluded that if an incision was made in the temporal clear cornea in phacoemulsification, it was found that there was a decrease in the sensitivity of the cornea that persisted until the 7th day and the 15th postoperative day.²⁰ Dry eye events in postoperative phacoemulsification patients were associated with corneal denervation, due to an incision in the clear cornea that is innervated by the ciliary long nerve which is a branch of the ophthalmic nerve.²¹ Loss of innervation or denervation from the cornea results in reduced blinking reflexes and decreased tear production, leading to increased epithelial permeability, and decreased metabolic activity of the epithelium. and inhibits wound healing so that it affects the mechanism of the lacrimal unit system which can cause or aggravate symptoms of dry eye and affect dry eye test values based on OSDI scores up to three months after surgery.²²

Based on the International Glaucoma Association (IGA) regarding trabeculectomy, explained that the discomfort that occurs is in the form of blurred vision for one to two weeks after trabeculectomy. Bleb drainage after trabeculectomy can also cause tears in the ocular surface, and cause discomfort in the form of dry eye symptoms such as blurred vision and pain that arises after trabeculectomy. It takes two to three months for the eyes to feel completely normal and vision becomes fully stable.²³

Janice Lam et al's research on ocular surface disease in posttrabeculectomy in 12 patients who had undergone trabeculectomy also found the emergence of dry eye symptoms through the results of a tear breakup time (TBUT) test of 5.32 seconds and Schirmer score of 6.14 mm / 5 min. There is another study by Ji Ho et al who analyzed dry eye disease in patients with functioning filtering post trabeculectomy blebs, this study shows that dry eye disease is relatively common in patients with bleb that functions after trabeculectomy, which is related to the relationship between bleb morphology and surface instability eyes.²⁴

Changes in OSDI scores before and after the facotrabeculectomy operation can be explained by inflammatory reactions on the ocular surface caused by



combined surgical procedures on glaucoma and cataracts that affect the lacrimal functional unit that plays a role in the mechanism of tear film, causing dysfunction of the lacrimal functional unit causing eye symptoms dry eye or dry eye symptom which later can give effect to dry eye test values based on OSDI score.²⁵

CONCLUSION

There is a change in OSDI score before and two weeks after the facotrabeulectomy operation due to an inflammatory reaction on the ocular surface that affects the lacrimal functional unit that plays a role in the tear film mechanism, causing dysfunction of the lacrimal functional unit so that it can cause symptoms of dry eye or dry eye symptom which can later have an effect on the lacrimal functional unit dry eye test values are based on OSDI scores.²⁵

Ethical Approval

Ethical clearance was obtained from Research Ethic Commission Medical Faculty Diponegoro University with the number of 188/EC/KEPK/FK-UNDIP/V/2019.

Conflicts of Interest

The authors declare no conflict of interest.

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Author Contributions

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