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Original Article

Efficacy of Using Cationorm and Systane Eye Drops on Post-Lasik Dry Eye

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ABSTRACT

LASIK is famous procedure for correcting refractive errors. The post-LASIK dry eye is very common. Systane and cationorm eye drops are good for post-LASIK dry eye. **Objectives:** To evaluate and compare the efficacy of Cationorm and Systane eye drops and assess the effect on asthenopic symptoms post-LASIK dry eye. **Methods:** A Qusai experimental study design was used. This study included 80 patients with the age of 20 to 35 years. Data were collected at Al Qasim Eye Care. 40 patients were treated with cationorm; and other were treated with Systane on post-LASIK dry eye. After using cationorm and systane eye drops assessment of dry eye was measured by TBUT. Patients came for follow ups at 2nd day, 15th day and 1 month after the LASIK procedure was done. Statistical analysis was done by applying Mann Whitney U test, Friedman's two-way test, Cochran's test and chi square test. **Results:** The mean value and standard deviation of Systane and cationorm eye drop recorded at the baseline were 10.00, ± 0.00, 10.00 ± 0.00, after 2nd day it was 8.08 ± 1.163, 8.48 ± 0.987, after 15 days 8.93 ± 2.485, 12.30 ± 1.713, and 1 month 9.05 ± 2.417, 12.93 ± 1.745 respectively. There was a significant effect on post-LASIK dry eye after using Systane and Cationorm eye drop with p<0. 001.Comparison of systane and Cationorm eye drops with asthenopic symptoms on post-LASIK dry eye showed cationorm is better than the systane eye drops. **Conclusions:** Cationorm showed more significant results as compared to systane eye drops and cationorm gave faster relief from asthenopic symptoms on post-LASIK dry eye

INTRODUCTION

Human eye is thought to be one of the most sensitive human body organs which is gives us the sense of sight [1]. The front most surface of our eye is called cornea which is transparent, and it protects all inner layers of the eye [2]. The cornea of our eye consists of five layers. First and front most layers are called the corneal epithelium which is almost 50 microns thick [3]. Laser-assisted in situ keratomileusis surgery, known as (LASIK) or laser eye surgery. The purpose of this procedure is to correct the refractive error by reshaping the cornea using a laser. In the LASIK procedure, we reshaped the dome-shaped corneal tissue in front of the eye by using an exceptional cutting laser to improve eyesight. LASIK is commonly used for myopia (farsightedness), hyperopia (nearsightedness), and astigmatism. It's a painless procedure. For this procedure, we only need an hour for both eyes. After this procedure is done vision can be established within 24 hours. After surgery patient doesn't need any stitches or bandages [4, 5]. After surgery most of the patients can suffer from many symptoms such as burning, stinging, excessive tear manufacture, mucus nearby the eyes, discomfort, and burry vision. The complications of LASIK are the following: Short-term discomfort, vision disruption, flap difficulty, aberrations, irregular astigmatism, epithelial ingrowth, diffuse lamellar keratitis, keratoconus, dry eyes, eye infections. SMILE is a different kind of surgery, which has lesser chances of causing post-operative dry eye because it has a lesser impact on corneal nerves [6]. Not every patient is appropriate for LASIK surgery. There is a possibility of intra operative complications, flap dislocation, intensity to laser, post-LASIK dry eye and increased intra ocular pressure post-LASIK [7, 8]. LASIK

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has its own limits such as if a patient has large pupils, unsteady refractive error, age more than 35, very thin cornea, and dry eye syndrome before surgery. After the LASIK procedure, dry eye is the most common side effect. Some of the patients after surgery had dry eye problems because of the tear film disturbance. It is supplemented by increased osmolality of the tear film and swelling of the ocular surface. It can cause by insufficient tear production or excessive tear evaporation. Evidences that maintain the relationship between inflammations, dry eye disease and support the use of anti-inflammatory therapy for dry eye disease [9]. Post-LASIK dry eye is due to loss of corneal innervation during making flap and also damage the loop of the corneal lacrimal gland, cornea and meibomian gland blinking that may cause a reduction in aqueous and lipid Tear and mucus secretion [10, 11]. Dry eye before surgery and womanish gender are threat factors for developing habitual dry eye after LASIK. Operation of the optical face during LASIK can minimize optical face damage and the threat of adverse issues [12]. There are many drugs that we are suggesting for the post-LASIK dry eye. PRGF eye drops are the most effective eye drops for dry eyes they are giving better results after the LASIK procedure. Lubricant eye drops are also pain-relieving in the post -LASIK dry eye. Some of the most common treatment for dry eyes is artificial tears, topical cyclosporine, hot compress, punctual plug, and serum eye drops [13, 14]. Systane and cationorm forms are the most popular eye drops which are used for dry eye in post-LASIK surgery. Cationorm is a very special type of eye drop. It is known as a positively charged cationic emulsion. It comforts staying on your eye's surface by making artificial tears and gives long-lasting pain relief [15, 16]. Systane ultra-lubricant eye drops are most commonly used in post-LASIK dry eye patients. The purpose of this eye drop is moisture, soothing comfort, and refreshing eye surface. Systane is a rare combination that gives long-lasting relief from dry eye and gives soothing comfort and a refreshing feel [17].

METHODS

A Quasi experimental study design was used. Study was conducted at Department of Ophthalmology in Private sector of Dera Ghazi Khan. Time duration of the study was from September 2021 to June 2022. Non probability Purposive sampling technique was applied in this study. Total numbers of post-LASIK dry eye patients were 80. They were divided into 2 groups. Each group contains 40 patients. Post-LASIK dry eye patient was included. Age under 20 years to 35 years was included. Both genders were included. Cationorm and Systane drops were included. Exclusion criteria was Computers or mobiles user dry eye patients were excluded. Pre-Lasik dry eye patients were excluded. Patient with corneal diseases that causes dry eye were excluded. Patients with Sjogren's syndrome were excluded. Pregnant ladies were excluded. PCO ladies with dry eyes were excluded. Contact lens user was excluded. Patient with diabetes was excluded. Data collection instruments was Fluorescein strips was used. 40ml Systane eye drop was used. 15ml Alkane eye drop was used. 10ml Cationorm eye drop was used. Nikon D5100 SLR was used. Data collection tool was Self-designed proforma used in this study. Slit-lamp is a stereoscopic bio microscopy, an instrument to perform many procedures. It is a standard and accurate method of measuring TBUT. After that TBUT was performed. A patient was anesthetized with alkane eye drops for 1 to 2 minutes that has temporary anesthetic effect on eye. After that a fluorescein strip was wet with saline drops without preservatives. Then asked patient to look up and fluorescein strip was rubbed on blubber conjunctiva then asked patient to close the eye and blink rapidly as to spread the dye fully all over the eye. Turn on the cobalt blue filter to assess the tear break up time under diffuse illumination. Then asked patient to blink fully and then stop blinking time was noted from the stop blink to first dry spot or dry lines appear on tear film. More than 10 second was marked as normal. 7-8 second was marked mild dry eye. Less than 5 second was marked sever dry eye. Then patient was undergoing a LASIK procedure. Patient was asked to come on follow up after 2 days of LASIK procedure. Then again TBUT was performed on all patients and data was recorded. Then systane eye drops was prescribed to 40 patients and Cationorm eye drops was prescribed to 40 patients. After 15 days of LASIK procedure patient again was asked to come on 2nd follow up.2nd follow up again TBUT was performed on all patients and data was noted on Performa and OSDI was filled by all patients to check the effect of eye drops on asthenopic symptoms. The score was calculated after filling the OSDI. Then Patient came on 3rd follow up after 1 month of LASIK procedure and using eye drops, at this follow up again TBUT was performed and OSDI was filled by both groups. Data analysis was done on the statistical package for the social sciences (SPSS) 20.0 version by applying Mann Whitney U Test, Friedman's Two-Way Test, Cochran's Q Test and Chi Square Test.

RESULTS

The goal of the study was to compare the effectiveness of Systane and Cationorm eye drops on post-LASIK dry eyes in order to determine whether eye drop has a better impact on this condition. It also sought to determine whether patients' symptoms would improve as a result of taking these eye drops. 80 patients with post-LASIK dry eye were included with the age ranges from 20 to 35 years. Two groups were having 40 patients each. One was treated with Systane eye drops and other with Cationorm eye drops. Dry

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eye was recorded at baseline, within 2 days, at 15 days and after 1 month. The data was analyzed by Mann-Whitney U test with Cochran's Q test, Friedman's two-way analysis and chi-square test. The mean value and standard deviation of Systane eye drop recorded at the baseline were 10.00±0.00, 8.08±1.163 after 2 days, 8.93±2.485 after 15 days, 9.05±2.417 after 1 month. There was a significant effect on post-LASIK dry eye after using Systane eye drop with p<0.001. Dry eye was absent at baseline data collection but appeared in 1st follow up after LASIK procedure and in the 2nd and 3rd follow up, it showed significant improvement on dry eye, Table 1.

Systane	N	Minimum	Maximum	Mean ± SD	p-value
Baseline	40	10	10	10 ± 08.0	<0.001
1st Follow-up	40	5	10	8 ± 1.638.9	
2nd Follow-up	40	5	14	3 ± 2.485	
3rd Follow-up	40	5	14	9.05 ± 2.417	

Table 1: Evaluation of Systane eye drop on post-LASIK dry eye.

The mean value and standard deviation of Cationorm eye drop recorded at baseline were 10.00 ± 0.00, 8.48 ± 0.987 after 2 days, 12.30 ± 1.713 after 15 days, 12.93 ± 1. 745 after 1 month. There was a significant effect on post-LASIK dry eye after using cationorm eye drop with p<0. 001. Dry eye was absent at baseline data collection but in 1st follow up, it showed dry eye which was after LASIK procedure and in the 2nd and 3rd follow up it show significant improvement on dry eye, Table 2.

Cationorm	N	Minimum	Maximum	Mean ± SD	p-value
Baseline	40	10	10	10 ± 0	<0.001
1st Follow-up	40	6	10	8.48 ± 0.987	
2nd Follow-up	40	8	14	12.3 ± 1.713	
3rd Follow-up	40	9	16	12.93 ± 1.745	

Table 2: Evaluation of Cationorm eye drop on post-LASIK dry eye

The mean value and standard deviation of systane and cationorm eye drops baseline data pre-LASIK was 10.0 ± 0.00. The p-value was 1 which means all the patients before LASIK was without dry eye. 1st follow after LASIK procedure dry eye was recorded. The mean value and standard deviation of Systane and cationorm eye drop was 8.08 ± 1.163, 8.48 ± 0.987 respectively. The value of p was 0.610 which is greater than 0.05 which means in the 1st follow up patients showed dry eyes with no better effect of systane and cationorm eye drops. 15 days of LASIK procedure dry eye was recorded. The mean value and standard deviation of Systane and cationorm eye drops was 8.93 ± 2.485, 12.30 ± 2.417, respectively. The p value was <0.001 which is less the 0.05 which means systane and cationorm showed significant results against the post-LASIK dry eye. But cationorm showed better effect on post-LASIK dry eye. 1 month of LASIK procedure done was recorded. The mean value and standard deviation of Systane and cationorm eye drop was 9.05 ± 2.417, 12.93 ± 1.745 respectively. The value of p was <0.001 which means systane and cationorm eye drops showed significant results on post-LASIK dry eye. But cationorm showed more significant result on post-LASIK dry eye.

Comparison of systane and cationorm eye drops on post-LASIK by using Mann Whitney U test						
Group		N	Minimum	Maximum	Mean ± SD	p-value
Baseline	Systane	40	10	10	10.00 ± 0.000	1
	Cationorm	40	10	10	10.00 ± 0.000	
1st Follow-up	Systane	40	5	10	8.08 ± 1.163	0.610
	Cationorm	40	6	10	8.48 ± 0.987	
2nd Follow-up	Systane	40	5	14	8.93 ± 2.485	<0.001
	Cationorm	40	8	14	12.30 ± 1.713	
3rd Follow-up	Systane	40	5	14	9.05 ± 2.4171	<0.001
	Cationorm	40	9	16	2.93 ± 1.745	

Table 3: Comparison of systane and cationorm eye drops on post-LASIK

According to the table 4, cationorm eye drops showed that the asthenopic symptoms of post-LASIK dry eye were more stable than the systane eye drop.

Chi-Square		3rd Follow-up		Total	P-value
		Yes	No		
Did you feel itchy?	Cationorm	0.0%	40 (100%)	40	0.012
	Systane	6 (15.4%)	33 (84.6%)	39	
Did you feel sore?	Cationorm	_	40 (100%)	40 (100%)	_
	Systane	_	39 (100%)	39 (100%)	
Did you feel dry?	Cationorm	3 (7.5%)	37 (92.5%)	40 (100%)	<0.001
	Systane	27 (69.2%)	12(30.8%)	39 (100%)	
Did you feel gritty?	Cationorm	1 (2.5%)	39 (97.5%)	40 (100%)	<0.001
				39 (100%)	
	Systane	29 (74.4%)	10 (25.6%)	40 (100%)	<0.001
				39 (100%)	
Did you feel burning?	Cationorm	0.0%	40 (100%)	40 (100%)	<0.001
	Systane	19 (48.7%)	20 (51.3%)	39 (100%)	
Did you feel irritation?	Cationorm	0.0%	40 (100%)	40 (100%)	<0.001
	Systane	18 (46.2%)	21 (53.8%)	39 (100%)	
Did you feel watering?	Cationorm	0.0%	40 (100%)	40 (100%)	<0.001
	Systane	16 (41%)	23(59%)	39 (100%)	
Did you feel sensitive to light?	Cationorm	3 (7.5%)	37 (92.5%)	40 100%)	<0.001
	Systane	19 (48.7%)	20 (51.3%)	39 (100%)	
Did you have stickiness?	Cationorm	0.0 (0%)	40 (100%)	40 (100%)	<0.001
	Systane	20 (51.3%)	19 (48.7%)	39 (100%)	
Did you feel achy in your eyes?	Cationorm	1 (2.5%)	39 (97.5%)	40 (100%)	<0.001
	Systane	28 (71.8%)	11 (28.2%)	39 (100%)	
Did you feel eye strain?	Cationorm	0.0 (0%)	40 (100%)	40 (100%)	<0.001
	Systane	24 (61.5%)	15 (38.5%)	39 (100%)	

Table 4: Comparison of asthenopic symptoms with post-LASIK dry

DISCUSSION

Efficacy of using Systane and cationorm eye drops on post-LASIK dry eye was assessed in this study. The aims of this study to assess and compares the effect of Systane and cationorm eye drops on post-LASIK dry eye. Patients with age's groups 20 to 35 years were included in this study. Total 80 post-LASIK dry eye patients were selected. Two groups were formed. One having Systane eye drop treatment and other was treated with cationorm eye drop. A research was

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conducted in 2020 for evaluation of capability and safety of VisuEvo and cationorm for the treatment of evaporative and non-evaporative Dry Eye condition. 72 patients with evaporative (n=54) and non-evaporative DED (n=18) were recalled for this research. For the assessment of dry eye TBUT and Schirmer I was performed. Patient fulfillment, OSDI score were observed. The results showed that intergroup difference for means TBUT values were not significant. The p value was 0.10, 0.63 respectively. The safety profile was normal for both eye treatments. VSE effects were almost equal to CTN in restoring tear film [18]. In present study to assessed the efficacy and comparison of systane and cationorm eye drops on post-LASIK dry eye. Out of 80 patients 40 were treated with systane and other 40 were treated cationorm eye drops. Assessments of tear film were measured on every follow ups with TBUT only. The p value was <0.05(<0.001) which means cationorm was a good eye drop for post-LASIK dry eye. A result shows that cationorm was a better for post-LASIK dry eye than systane eye drops. A research was conducted in 2022 to evaluate efficacy of punctual plug on post-LASIK dry eye. For this purpose, 18 post-LASIK patient was included in this study and had not responded to the artificial tears by one-month post-surgery. They were divided into two groups (plug and non-plug). After one-month surgery puncta plug were inserted into the superior and inferior puncta in the plug group. For the assessment of dry eye TBUT, Schirmer, fluorescein staining was measured. Symptoms were compared between 1 and 3 months after surgery. Results shows that TBUT, FS and Schirmer test were significantly improved in plug group at 3 months. The comparison of TBUT, FS, Schirmer test were show significantly enhance in plug groups than the non-plug group [19]. Present study was to assess the efficacy of Systane eye drops on post-LASIK dry eye. 80 participants were selected for this study. Post-LASIK dry eye patients were divided into two groups. 40 post-LASIK dry eye patients were treated with Systane eye drop. Measurement of dry eye was assessed by TBUT. On the 2nd day of post-surgery, after 15 days of surgery and after 1 month on post- surgery data were assessed. The p value of Systane eye drop was <0.001 (<0.05) which shows that systane eye drops was significantly improve post LASIK dry eye patients. A study was done in 2021 to compare the efficacy and safety of a preserved-free, multi-ingredient carboxymethylcellulose hyaluronic acid and organic osmolytes to preservative-free carboxymethylcellulose in the treatment of post-LASIK dry eye. Total 126 subjects were selected for the assessments. Two groups were formed. For the assessment of dry eye was measured with TBUT, Schirmer test. Results shows that OSDI score were normal for both groups. At the day of 30, the p value of preservatives-free carboxymethyl cellulose was 0.013 indicating that management was not satisfying for post-LASIK dry eye. CMC-HA was shows good safety and supportive eye drops for post-LASIK dry eye [20]. In current study to compare the efficacy of Systane and cationorm eye drops on post-LASIK dry eye was done. For the assessment of the dry eye TBUT were formed on 2nd day after surgery, 15 days of post-surgery and after 1 month. Data was recorded in a written form. The p value of Systane and cationorm eye drops was less than 0.05 (<0.001) which significantly showed enhancement in dry eye.

CONCLUSIONS

Cationorm eye drop showed more significant results and gave much better than Systane eye drop. Although Cationorm eye drop give the better and quicker relief from asthenopic symptoms on post-LASIK dry eye than Systane eye drop. Result revealed that Cationorm eye drop is preferred than the Systane eye drop for post-LASIK dry eye.

Conflicts of Interest

The authors declare no conflict of interest.

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