· Clinical Research ·

Effect of mitomycin C on the corneal endothelial cells of Saudi patients with myopia after transepithelial photorefractive keratectomy: a two-armed cohort study

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Abstract

● **AIM:** To study the effect of mitomycin C (MMC) applied during transepithelial photorefractive keratectomy (TPRK) on the corneal endothelium one week (W1) and three months (M3) after surgery and its determinants.

● **METHODS:** In this two-armed cohort study conducted in 2022, eyes treated with MMC during TPRK (group 1) were compared with eyes not treated with MMC (group 2). The corneal endothelial cell (EC) count, EC density (ECD; cells/mm^2), average (μm^2), standard deviation (μm^2), coefficient of variation (CV%), EC_{max}, EC_{min}, and EC percentage of hexagonality were estimated at W1 and M3. The postoperative changes in the EC count in the two groups were compared and correlated with the other independent variables.

● **RESULTS:** Group 1 had 26 eyes, and group 2 had 78 eyes. All TPRK indices were significantly higher for the eyes in group 1 than for those in group 2. The MMC usage was not a significant predictor of the change in ECD (P=0.644), change in CV (P=0.374), and change in the percentage of hexagonality of EC (P=0.164) at W1. However, the use of MMC was a significant predictor of changes in CV (P=0.014) and the change in the percentage of hexagonality of EC (P=0.039) at M3. The duration of laser exposure and the size of the optical zone influenced the correlation of MMC use with the changes in EC indices, postoperatively.

● **CONCLUSION:** The use of MMC doesn't affect ECD, CV, and percentage of hexagonality at W1 if other surgical indices are considered. At M3 after operating myopic eyes by TPRK, MMC significantly influence the CV and percentage of hexagonality. The duration of the laser application and the size of the optical zone should be considered when determining the effect of MMC on the EC indices.

● **KEYWORDS:** transepithelial photorefractive keratectomy; mitomycin-C; corneal endothelium

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INTRODUCTION

There is an ongoing epidemic of myopia, which is especially affecting the young generation. Genetic and environmental factors have been identified, and a public health approach to preventing and addressing this rising health issue has been proposed[1-2]. During the COVID-19 pandemic, myopia prevalence increased because of the fewer outdoor activities and increased time spent using digital devices[3]. Myopia can be managed with spectacles, contact lenses, or refractive surgeries[4]. Modern corneal refractive surgeries within the past two decades have become safe and efficient and offer spectacle-free, functional, normal vision[5]. The uptake of refractive surgeries is increasing in countries with high gross domestic products such as Saudi Arabia[6]. Corneal haze and residual refractive error are the two main complications that compromise the quality of life after corneal refractive surgeries[7]. Mitomycin C (MMC), an antimetabolite, is topically applied intraoperatively to reduce both transient and long-term corneal haze[8-9].

Trauma-related insults affect the cornea after refractive surgeries, which include transepithelial photorefractive keratectomy (TPRK)[10]. This may be attributed to laser-induced stromal ablation, denudation of epithelial barrier, thermal injuries to nerves, cells in the stroma and corneal endothelium, and toxic effects of chemicals used during and after surgery[11].

Endothelial cell (EC) indices used to evaluate the endothelium in pathological conditions or after surgery include EC count, EC density (ECD; cells/mm^2), average (μm^2), standard deviation (μm^2), coefficient of variation (CV%), EC_{max}, EC_{min}, and EC percentage of hexagonality. EC indices are affected by age, diabetes, and surgeries involving the lens, anterior chamber, and cornea[12-13].

Several studies have investigated the effect of the intraoperative use of MMC on endothelial status during refractive surgeries and reported it to be transient[14-18]. MMC primarily inhibits the growth of actively proliferating cells. Since the corneal endothelium is not a tissue that is actively dividing, it should be less susceptible to the effects of MMC. However, the dose and duration of the application of MMC to the cornea and the corneal thickness of the denuded stromal area influence the endothelial changes. Therefore, its use in addressing corneal haze is still debated[7].

Some studies have reported no changes, while others have reported increments followed by decrements of some EC indices following MMC usage in TPRK[15-16,18]. To the best of our knowledge, studies on all endothelial indices and preoperative factors, including laser surgical indices, at different postoperative periods have not been carried out. They may be useful in understanding the mechanism of changes in endothelial indices after using MMC and the role of refractive surgical indices in predicting the changes in EC indices.

We investigated the effect of MMC used during TPRK to treat myopia on the endothelium one week (W1) and three months (M3) after surgery and the preoperative corneal and surgical indices affecting the changes in the EC indices.

SUBJECTS AND METHODS

Ethical Approval The Ethical Committee of Qassim University approved this study (21-19-03). Written informed consent was obtained from the patients for the surgery and the use of their data for research. The tenets of the Helsinki Declaration were strictly followed during all stages of the research.

Patients undergoing TPRK to treat mild and moderate myopia between January and March 2022 at our institution were enrolled. Those aged 18-40y and agreeing to participate were included in the study. Patients with systemic conditions such as diabetes or mesodermal tissue disorders, history of ocular surgeries, dry eye, keratoconus, and glaucoma were excluded. This was a two-armed cohort study. The eyes of the patients with myopia who underwent TPRK with the administration of MMC intraoperatively were placed in group 1 (Gr1), and those who underwent TPRK without MMC were allocated to Group 2 (Gr2).

To calculate the sample size for the cohort study, we assumed that 80% of the eyes that underwent TPRK with MMC had no significant change in the EC count, whereas 50% of the eyes undergoing TPRK without MMC had a significant decline in EC count. To achieve a 95% confidence interval and 90% power for a ratio of 1:3 for the group allocations, we had to include at least 25 eyes in Gr1 and 75 eyes in Gr2. We used OpenEpi software to calculate the sample size[19].

The study was conducted at a private ophthalmology hospital in a small city in Saudi Arabia. One corneal surgeon trained and experienced in TPRK performed the surgeries.

The age, gender, and operated eye of the participants were recorded. Visual acuity was tested using a phoropter and ETDRS symbols projected at 3 m from the patient and recorded in logMAR notation. The uncorrected and best-corrected distance visual acuities were measured. The refractive status of each eye was recorded in diopters (D) for the spherical, cylindrical, and spherical equivalent (SE) refractive error. Myopia was further graded as mild (<-3.0 D) and moderate (-3.0 to >-6.0 D). We used a Pentacam camera (OCULUS-Netzteil Art., Pentacam HR, Germany) and Sirius (SCHWIND eye-tech-solutions, GmbH, Kleinostheim, Germany) to estimate keratometry (K_1 and K_2), central corneal thickness (CCT), and pupillary diameter. The anterior segments of the eyes were assessed using a slit lamp biomicroscope (Topcon, USA). A noncontact specular microscope (Tomey, EM-3000, Japan) was used to assess the endothelium and obtain the EC indices, including the EC count, ECD (cells/mm^2), average (μm^2), standard deviation (μm^2), CV (%), EC count maximum (EC_{max}), EC count minimum (EC_{min}), and EC percentage of hexagonality.

The TPRK details are described in the literature[20]. An Amaris 500 Hz excimer laser (SCHWIND eye-tech-solutions, GmbH, Kleinostheim, Germany) was used for surface ablation and set on aberration-free mode with a treatment zone of 6.5-7.5 mm, and the pupillary diameter was auto-adjusted. The goal set was to make the eye emmetropic after surgery. After ablation, we applied 0.02% MMC and diluted it in the balanced salt solution (BSS) on the ablated stroma for 30-50s, followed by irrigation with BSS to the eyes of Gr1. The duration of MMC application was 30-50s for all cases of mild to moderate myopia (50s for mild and 30s for moderate myopia). However, no MMC was used for the eyes of Gr2. We instilled one drop of 0.3% of ofloxacin and applied a soft bandage contact lens. From the software of the laser ablating machine, we recorded surgical parameters like the duration of laser application, maximum ablation depth (μm), central ablation depth (μm), total ablation zone (mm), transitional zone (mm), and optical zone (mm).

The postoperative treatment regimen included 0.3% topical ofloxacin four times daily until the contact lens was removed, 0.1% dexamethasone drops four times daily for one week followed by tapering of steroid drops within the next 6-8wk, and artificial tears four times daily for 12wk. The EC indices were measured once again at W1 and M3 after TPRK. The vision, CCT, corneal haze, and intraocular pressure (IOP) were measured at these visits.

The differences between the EC indices before and after surgery and at M3 were determined for each eye. The values of these indices for Gr1 and Gr2 provided information on the effects of MMC on the EC indices.

All equipment was calibrated before the study by the company engineer. The definitions of the variable used in the present study were based on internationally accepted definitions. One technician measured all preoperative and postoperative parameters. He was blinded to the groups of the patients. The statistician was also blinded to the groups of the eyes until the final interpretation with the principal investigator.

The data were collected in a pretested form and entered into a spreadsheet of the Statistical Package for Social Studies (SPSS 25; IBM, NY, USA). The qualitative variables were presented as number and percentage proportions, whereas the quantitative variables were presented as median and interquartile range. To compare the outcomes of Gr1 and Gr2, we used the nonparametric method of comparing two independent variables and performed the Wilcoxon signed rank test to estimate the coefficient correlation and two-sided *P*-value. Linear regression analysis was performed to determine the effects of the dependent variables on the change in EC count at W1 and M3. *P*-values of <0.05 were considered statistically significant.

RESULTS

This study involved 26 eyes of 13 patients with myopia who underwent TPRK with the application of MMC (Gr1) and 78 eyes of 39 patients (Gr2) who did not. The demography and preoperative parameters of the eyes in the two groups are compared in Table 1. The distribution of subjects according to gender, eye and degrees of myopia were shown in Table 2. The mean ages of the participants in Gr1 and Gr2 were 27.2±6.9 and 28.3±5.9y, respectively. The proportion of men in both groups was 46.2%. The eyes in Gr1 were less myopic and had better uncorrected distance visual acuities.

The TPRK surgical indices are provided in Table 3 and Figure 1. All TPRK indices for the eyes with MMC application were significantly higher than those for the eyes without MMC application.

The EC-related indices at W1 and M3 after TPRK for Gr1 and Gr2 were compared to their preoperative and intraoperative values to determine their changes (Table 4). The EC count significantly declined at W1 for Gr2, relative to that for Gr1 (*P*=0.032). All other presurgical and surgical variables were not significantly different. At M3 after TPRK, the changes in EC count (*P*=0.058) and EC count minimum (*P*=0.059) were significantly lower for Gr1 than for Gr2. The median changes in hexagonality for Gr1 at W1 and M3 were -1.0 (IQR -3.75; 1.75) and 5.0 (IQR -1.25; 10.3), respectively. The median changes in hexagonality for Gr2 at W1 and M3 were -1.0 (IQR -5.0; 3.2) and 2.0 (IQR -2.0; 7.0), respectively. The changes in hexagonality at W1 (*P*=0.99) and M3 (*P*=0.212) for the two groups were not significant.

Table 1 Myopic patient managed by transepithelial photorefractive keratectomy with and without using mitomycin-C

Parameter	Group 1 (26 eyes)	Group 2 (78 eyes)	P^a
Age			0.362
Median	25	27	
IQR	23; 29	24; 32	
Spherical refractive error			0.004
Median	-1.25	-2.0	
IQR	-1.56; -0.75	-3.5; -1.0	
Cylindrical refractive error			0.017
Median	-0.5	-0.5	
IQR	-0.75; 0.0	-1.25; -0.5	
Spherical equivalent			<0.001
Median	-1.5	-2.38	
IQR	-1.75; -1.0	-3.56; -1.5	
Uncorrected distance visual acuity			0.025
Median	0.35	0.5	
IQR	0.2; 0.5	03; 0.8	

IQR: Inter quartile range; [a]Mann-Whitney *U* test.

Table 2 Distribution of subjects according to gender, eye and degrees of myopia

Items	Number	Percentage	Number	Percentage	P^a
Gender					0.99
Male	6	46.2	18	46.2	
Female	7	53.8	21	53.8	
Eye					0.99
Right	13	50	39	50	-
Left	13	50	39	50	
Myopia					<0.001
Mild	26	100	48	61.5	
Moderate	0	0.0	30	38.5	

IQR: Inter quartile range; [a]Mann-Whitney *U* test.

The correlations of various variables with the changes in EC count at W1 and M3 after TPRK are provided in Table 5. Apart from the gender (*P*=0.62), preoperative SE (*P*=0.1), transition zone (*P*=0.291), and optical zone (*P*=0.59), all the other variables were significantly correlated with EC count changes at W1 after TPRK. Apart from gender (*P*=0.36) and preoperative SE (*P*=0.085), all other variables were significantly correlated with EC count changes at M3 after TPRK. The difference between the distance uncorrected visual acuities of Gr1 and Gr2 at three months after surgery was not significant (*P*=0.254).

Linear regression analysis suggested that the optical zone (*P*=0.03) was a significant predictor at W1, while the duration of laser application (*P*=0.27) was a significant predictor of change in the EC count at M3. The use of MMC was not a significant predictor of change in the EC count at W1 (*P*=0.505) and M3 (*P*=0.969).

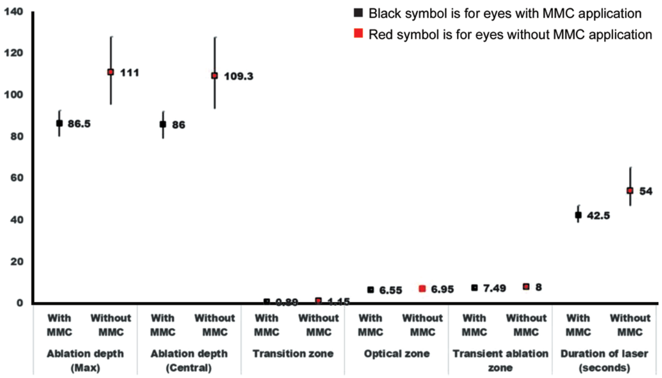

Figure 1 Transepithelial photorefractive keratectomy related indices in myopic eyes managed with and without using MMC X axis denoted different surgical indices for transepithelial photorefractive keratectomy; Y axis denoted the units of each surgery indices. High low lines depict 25% and 75% quartile values. MMC: Mitomycin C.

Table 3 Indices of transepithelial photorefractive keratectomy in eyes treated with and without mitomycin C

Parameters	Group 1 (26 eyes)	Group 2 (78 eyes)	P^a
Ablation depth (maximum)			<0.001
Median	86.5	111	
IQR	80; 92.4	95.5; 128	
Ablation depth (central)			<0.001
Median	86.0	109.3	
IQR	79.2; 92.1	93.3; 127.8	
Transition zone			<0.001
Median	0.89	1.15	
IQR	0.80; 0.96	0.94; 1.31	
Optical zone			0.007
Median	6.55	6.95	
IQR	6.55; 6.7	6.5; 7.0	
Transient ablation zone			<0.001
Median	7.49	8.0	
IQR	7.38; 7.66	7.69; 8.26	
Duration of laser (s)			<0.001
Median	42.5	54	
IQR	39; 47	47; 65.2	

[a]Mann Whitney *U* test. IQR: Inter quartile range.

None of the surgical indices was a significant predictor of change in the ECD at W1 and M3. The use of MMC was not a significant predictor of change in ECD at W1 (P=0.644) and M3 (P=0.792). The duration of laser application to the stromal surface (P<0.001) was a significant predictor of change in the CV% at W1. The use of MMC was not a significant predictor of change in the CV% at W1 (P=0.374). The change in CV at M3 had significant predictors including the use of MMC (P=0.014), CCT before surgery (P=0.013), age (P=0.015), optical zone (P=0.012), and duration of laser application (P<0.001).

The duration of laser application to the stromal surface (P=0.002) was a significant predictor of changes in the hexagonality of the EC at W1. MMC usage (P=0.164) was

Table 4 Changes in endothelial indices in myopic eyes managed by transepithelial Photorefractive keratectomy (TPRK) with and without using mitomycin-C

Parameters	Group 1 (26 eyes)	Group 2 (78 eyes)	P^a
Change at week 1 *vs* before surgery			
Endothelial cell count			0.032
Median	1.5	-15.5	
IQR	-7.0; 25.5	-35.5; 17.3	
Endothelial cell density (cells/mm^2)			0.241
Median	-15.5	13	
IQR	-55; 80	-37; 139	
Mean			0.281
Median	1	-1.0	
IQR	-5; 7	-14.2; 5.0	
Standard deviation			0 503
Median	3.5	0.0	
IQR	-4.75; 7.75	-13.2; 13.0	
Coefficient of variation (%)			0.519
Median	1	0	
IQR	-0.75; 2.0	-3.0; 3.0	
Cell count maximum			0.903
Median	-72.5	-18.5	
IQR	-174; 176	-266.8; 148.3	
Cell count minimum			0.644
Median	-12.5	-0.5	
IQR	-22.8; 19.5	-20.2; 11	
Hexagonality of endothelial cells (%)			0.987
Median	-1.0	-1.0	
IQR	-3.75; 1.75	-5.0; 3.2	
Change at month 3 *vs* before surgery			
Endothelial cell count			0.058
Median	4.0	-7.0	
IQR	-5.0; 14.0	-33.5; 13.3	
Endothelial cell density (cells/mm^2)			0.902
Median	37	55	
IQR	-8.25; 121	-40.0; 162.3	
Mean			0.821
Median	-5.0	-5.5	
IQR	-15.2; 1.0	-18; 5	
Standard deviation			0.469
Median	-8.0	-6.0	
IQR	-19.0; -2.25	-23.8; 5.0	
Coefficient of variation (%)			0.4
Median	-1.0	-1.0	
IQR	-5.0; 0.25	-4.0; 1.0	
Cell count maximum			0.330
Median	-48.5	-4.0	
IQR	-229; 81.3	-210; 187	
Cell count minimum			0.059
Median	10	-3.0	
IQR	-9.5; 28.3	-12; 11	
Hexagonality of endothelial cells (%)			0.212
Median	5.0	2.0	
IQR	-1.25; 10.3	-2.0; 7.0	

[a]Mann-Whitney *U* test; IQR: Inter quartile range.

Table 5 Factors correlated to the change in endothelial cell count of myopic eyes after one week and 3mo of transepithelial photorefractive keratectomy with and without using MMC

Parameters	1wk after TPRK				3mo after TPRK			
	With MMC (*n*=24)		Without MMC (*n*=78)		With MMC (*n*=22)		Without MMC (*n*=76)	
	Z	*P*	*Z*	*P*	*Z*	*P*	*Z*	*P*
Age	-1.65	0.1	-2.75	0.006	-3.89	<0.001	-4.1	<0.001
Gender	-0.08	1.0	-0.55	0.62	-0.45	0.67	-0.92	0.36
Pre spherical equivalent	-1.29	0.2	-1.63	0.1	-1.5	0.135	-1.7	0.085
Pre central corneal thickness	-4.29	<0.001	-7.6	<0.001	-4.1	<0.001	-7.5	<0.001
Pupil diameter	-0.03	0.9	-3.5	0.001	-4.38	0.66	-3.75	<0.001
Ablation depth (max)	-4.26	<0.001	-7.67	<0.001	-4.08	<0.001	7.56	<0.001
Ablation depth (central)	-4.26	<0.001	-7.67	<0.001	-4.1	<0.001	-7.55	<0.001
Transition zone	-0.87	0.391	-1.06	0.291	-2.55	0.01	-2.72	0.006
Optical zone	-0.17	0.86	-0.536	0.59	-3.57	<0.001	-3.8	<0.001
Transient ablation zone	-0.37	0.71	-3.78	<0.001	0.76	0.445	-4.0	<0.001
Duration of laser	-3.66	<0.001	-7.37	<0.001	-3.46	<0.001	-7.34	<0.001

Z: Correlation coefficient; *P*: Two-sided *P* value using nonparametric method of analysis. TPRK: Transepithelial photorefractive keratectomy; MMC: Mitomycin C.

not a significant predictor of changes in the hexagonality of the EC at W1. The use of MMC (*P*=0.039), duration of laser application (*P*=0.004), and optical zone (*P*=0.05) were significant predictors of changes in the hexagonality of the EC at M3.

DISCUSSION

In this cohort study, the eyes undergoing TPRK with 0.3% MMC (0.2 mg/mL) application for 30-50s had stable EC counts at W1 and M3. For the eyes not treated with MMC, the EC count declined at W1 and M3 after TPRK. MMC usage was not a significant predictor of the changes in ECD, CV, and EC percentage of hexagonality at W1. However, MMC usage was a significant predictor of changes in the CV and changes in the percentage of hexagonality of the EC at M3. The duration of laser exposure and optical zone influenced the association of MMC usage with the changes in EC indices.

Corneal surgeons and ophthalmic societies are recommending the use of MMC in corneal refractive surgeries to minimize corneal haze and improve visual outcomes and vision-related quality of life[8,20-22]. Very few studies provide evidence of the effect of MMC on the corneal endothelium after accounting for different surgical indices. The present study shows that the changes in the EC indices such as the ECD, CV, and percentage of hexagonality for the eyes treated with and without MMC were not significantly different at W1 after TPRK. The use of MMC influenced changes in the CA and percentage of hexagonality of EC at M3. Reviewing different EC indices can provide insights into the physiological, as well as physical changes, in the corneal endothelium due to the use of MMC and effects of TPRK indices.

We found that eyes undergoing TPRK and MMC had significantly less reductions in the EC count than those not treated with MMC at W1 after surgery. However, this difference was marginally significant at M3 after TPRK. All other indices were not significantly different for the two groups. The use of MMC in photorefractive keratectomy (PRK) resulted in an EC count decline in studies by Nassiri *et al*[23] and Morales *et al*[24]. The EC count decline after using MMC in the present study did not correspond to excellent postoperative vision and the absence of corneal haze in any of the operated eyes. Further studies using different MMC concentrations and durations of laser exposure may provide further insights into this observation and the possible cause of the decline in the EC count.

ECD is a benchmark index used to study the effects of various corneal procedures like collage cross-linkage, keratoplasty, and laser-assisted *in situ* keratomileusis (LASIK) on the EC status[25-27]. In these studies, surgical trauma indices temporarily decline in ECD. In our study, the decline was not significant at W1 and M3. However, the ECD variability was marked in both groups, suggesting multiple factors influencing changes in ECD in addition to the use of MMC. This was observed in a regression analysis where MMC usage was not a significant predictor of change in ECD.

The changes in ECD in the groups treated with and without MMC in our study were consistent with the findings of Mohan *et al*[17]. They studied the effect of the EC indices at six months after PRK and the application of 0.02% MMC to the ablated area. ECD was reduced by 43 cells/mm^2 for 139 eyes but not significantly, compared with its value before surgery (*P*=0.07). In another study in Iran, 188 eyes underwent PRK and laser epithelial keratomileusis, and 0.02% MMC was applied to the eyes that had an ablation depth of ≥65 μm. The authors reported that no significant changes in ECD at M3 and 6mo relative to the value before surgery. There were significant changes in the endothelium of the eyes with ablation depths of ≥65 μm, relative to those with depths of <65 μm[28]. This indirectly represents the effects of the surgical indices on the EC indices. The grades of myopia can also influence the ablation depth in TPRK and have differential effects on the endothelium[16]. Several factors seem to affect EC state during TPRK when MMC is used. In our study, the surgical indices had significantly higher values for the eyes treated with TPRK without MMC than for those treated with MMC. Differential surgical indices may have had a confounding effect on the association of the changes in the EC indices with the use of MMC during TPRK and should be reviewed before drawing conclusions from this study.

The CV is a sign of pleomorphism, whereas the percentage of hexagonality is a measure of polymegathism[29]. Changes in the hexagonality of the ECs indicate cell damage. Loss of endothelial cell density is accompanied by increased cell size variability (polymegathism) and cell shape variability (polymorphism). If this is not observed after corneal surgery, corneal edema can occur. The surgical stress and toxic effects of chemicals such as MMC cause morphological changes like polymegethism and pleomorphism[30]. In our study, there was no significant decline in the CV at W1 and M3 for both groups. The difference between the eyes in Gr1 and Gr2 was also not significant. In contrast, Mohan *et al*[17] reported a significant increase in CV at 6mo after PRK with the use of MMC.

The EC percentage of hexagonality (6A) reflects the morphological changes attributable to genetic and external factors. In our study, this index had a marginal decline at W1 and an increase at M3. However, the difference between the groups with and without MMC was not significant. Mohan *et al*[17] noted a significant increase in the percentage of hexagonality in the eyes treated with PRK with MMC. The morphological changes due to stress on the cornea caused by surgery and chemicals seem to be compensatory and transient. The loss of ECD is accompanied by increased polymegathism and polymorphism. If this is not observed after corneal surgery, corneal edema can take place because of damage to the pumping mechanism of the endothelial cell layer. Its implications for and the long-term impact on the physiology of the cornea and visual acuity should be further studied.

In this study, the same concentration of MMC was used for all groups, irrespective of the severity of myopia. The intraoperative topical 0.02% MMC was more effective when administered for 30s than for 15s in inhibiting haze development following PRK for high myopia[31].

There were a few limitations of our study. The eyes treated with MMC were few, and a nonparametric method had to be used to compare them with the eyes that were not treated with MMC. A study with larger samples will confirm the present study findings. We used an MMC concentration of 0.02%, which is recommended by professional bodies[21-22]. Therefore, outcomes can be safely compared with the reports in the literature to review the effects of EC indices.

Based on the present study, MMC use with TPRK can be advocated to address corneal haze without concerns for long-term endothelial cell damage. The concentration used in the present study was higher than recommended, and the difference between the ECDs of the eyes exposed to MMC and those that were not different. At three months after surgery with MMC application, the changes in the morphology of the endothelium may be attributed to MMC. However, they did not cause corneal edema or corneal haze. Our study focused only on mild and moderate myopia with ablation depths of <400 μm. The surgical indices were different in those treated with MMC and without MMC. To predict the impact of MMC on EC indices, the preoperative and intraoperative indices should be considered.

MMC use during TPRK to treat mild and moderate myopia seems to be safe and does not result in sustained damage to corneal endothelial cells. The surgical indices are important in evaluating the impact of stress on the endothelium after modern corneal surgeries.

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