

Comparison of Topical Steroid Drops with Cyclosporine Eye Drops In Epidemic Keratoconjunctivitis

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ABSTRACT

Purpose: To compare the effect of topical steroid with cyclosporine eye drops in recurrence of sub-epithelial corneal infiltrates in epidemic keratoconjunctivitis.

Study Design: Quasi Experimental study.

Place and Duration of Study: CMH Kharian from Jan 2017 to June 2018.

Material and Methods: Eighty eight patients with epidemic keratoconjunctivitis, were divided into two groups. Group A included patients who received topical steroid drops and group B received topical Cyclosporine eye drops. The inclusion criteria comprised of fresh cases of SEIs, between the ages of 20 to 50 years, having a vision of 6/6 before the illness. The exclusion criteria included patients suffering from allergic conjunctivitis, ocular surface disease like Sjogren syndrome, corneal ulcer, blepharitis, old corneal opacity, glaucoma and those who had been using steroids in the past e.g. uveitis. The patients were followed up at 2, 4, 8 and 12 weeks. On resolution of sub-epithelial infiltrates (SEIs), both regimen were tapered off in next two weeks. The patients were advised to continue monthly follow up for two months to see any recurrence.

Results: SEIs resolved in both the groups by week 12, however the resolution was slightly quicker in group A. SEIs resolved in 84.1% of cases in group A and in 70.4% cases in group B at the end of 4 weeks. Recurrence was higher in group A (11.3%) while it was 4.5% in group B.

Conclusion: Cyclosporine eye drops are a safe and equally effective treatment of epidemic keratoconjunctivitis related SEIs, with an added advantage of reduced recurrence rate.

Key Words: Epidemic, Keratoconjunctivitis (EKC), Cornea, Subepithelial Infiltrates, Cyclosporine.

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INTRODUCTION

Epidemic keratoconjunctivitis (EKC) is the most common cause of infectious conjunctivitis worldwide

accounting for about 75% of all cases.¹ Its morbidity is high in children and immunocompromised patients.² It is caused by adenovirus strains 8, 19 and 37.^{3,4,5,6} It has a direct mode of transmission, i.e. by hands, fomites etc. and indirect i.e. by tonometer, eye dropper bottle, slit lamp.³ The incubation period is usually 2 to 14 days and the person remains infectious for up to 10 to 14 days after the onset of symptoms.^{7,8} The corneal involvement typically appears after 7 to 10 days of initial presentation in the form of Sub Epithelial Infiltrates (SEIs) in the anterior stroma.⁹ These opacities are pathognomonic of EKC and may persist

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for several weeks to years causing visual deterioration, glare, photophobia and irregular astigmatism.¹⁰ SEIs represent cellular immune reaction comprising of lymphocytes, macrophages and antigen presenting Langerhans cells.¹¹ Although it is a self-limiting disease, but treatment is frequently needed to shorten the duration and relieve the symptoms.¹² Some Ophthalmologists have used topical steroid eye drops to resolve these lesions with encouraging results, however these drops are associated with increased frequency of recurrence of these lesions.¹³ Cyclosporin eye drops have also shown promising results in resolution of SEIs with an added advantage of reduced chances of recurrence.¹³

This study was done to compare recurrence of SEIs after stopping topical Cyclosporin eye drops versus steroid eye drops.

MATERIAL AND METHODS

This study was conducted at CMH Kharian from January 2017 to June 2018, after taking approval from the hospital ethical committee. A total of 88 patients fulfilling the above criteria were included in the study. After taking the informed consent the patients were divided into group A and group B using nonprobability lottery method. Group A included patients who received topical steroid drops and group B received topical Cyclosporine A eye drops. The inclusion criteria comprised of fresh cases of SEIs, between the ages of 20 to 50 years, having a vision of 6/6 before the illness. The exclusion criteria was patients suffering from allergic conjunctivitis, ocular surface disease like Sjogren syndrome, corneal ulcer, blepharitis, old corneal opacity, glaucoma and those who had been using steroids in the past. Diagnosis of epidemic keratoconjunctivitis related SEIs was made clinically based on symptoms of glare, photophobia and blurred vision after recent episode of epidemic keratoconjunctivitis. On Slit lamp examination, SEIs were confirmed as greyish white granular sub epithelial lesions with fuzzy borders.

All patients underwent complete ophthalmic examination including visual acuity, tear film assessment, corneal examination and anterior chamber assessment. Intra ocular pressure was measured using air puff tonometer. The corneal sub epithelial opacities were examined under high magnification of slit lamp and counted, and the patients were divided into two groups depending upon the number of SEIs in each

cornea, i.e. less than eight SEIs or more than eight SEIs. Patients in group A were started with topical Loteprednol eye drops eight hourly and those of group B were started with topical Cyclosporine 0.05% eye drops eight hourly. The patients were followed up at 2, 4, 8 and 12 weeks. Resolution of SEIs were defined as complete disappearance of these opacities leaving behind clear cornea. On resolution both Cyclosporine and Loteprednol eye drops were tapered off in next two weeks. The patients were advised to continue monthly follow up for next two months, during which they were assessed for any recurrence of corneal SEIs.

Data was recorded in predesigned proforma and SPSS version 21 was used for data analysis. Frequency and percentages were calculated and presented for qualitative data. Student t-test was applied for numerical variables. P value ≤ 0.05 was considered as significant.

RESULTS

A total of 88 patients were included in this study. The demographic details are shown in table 1 which shows the mean age of patients in group A was 30.47 years (20 to 49 years) while it was 29.54 years for group B (20 to 46 years).

Table 1: Demographic characteristics.

Age in Years	Group A	Group B
20 – 30	23	25
31 – 40	15	14
41 – 50	6	5
Range	20 to 49 years	20 to 46 years
Mean age	30.48 \pm 7.53	29.55 \pm 7.17
No. of Males	29	26
No. of Females	15	18

Table 2: Resolution of Corneal SEIs.

Corneal Involvement	Group A (n = 44)	Group B (n = 44)
Less than 8 SEIs	30 (68.18%)	26 (59.09%)
More than 8 SEIs	14 (31.81%)	18 (40.90%)
Resolution in 2 weeks	14 (31.8%)	10 (22.7%)
Resolution in 4 weeks	23 (52.2%)	21 (47.7%)
Resolution in 8 weeks	4 (9.1%)	11 (25%)
Resolution in 12 weeks	3 (6.8%)	2 (4.5%)

As is clear from table 2 that SEIs resolved in both the groups by week 12, however the resolution was slightly quicker in group A. In group A 31.8% of SEIs resolved at the end of second week and another 52.3%

by the end of fourth week (total 84.1%) whereas 22.7% resolved at second week and another 47.7% at the end of fourth week (total 70.4%) in group B at the end of same interval.

Table 3: *Recurrence of SEIs.*

	Total Number	Recurrence	P Value
Group A	44	5 (11.3%)	0.017
Group B	44	2 (4.5%)	

DISCUSSION

Viral Keratoconjunctivitis is a condition that frequently affects the population as an epidemic especially in summers. The human Adenovirus accounts for about 65% to 90% of these.^{14,15,17} In addition to its morbidity it also costs in the form of lost productivity and cost of medicines etc. which amounts to 430 million US dollars.¹⁶ Epidemic Keratoconjunctivitis involves both the conjunctiva and cornea and can cause long lasting morbidity in the form of development of corneal SEIs. Traditionally it had been treated symptomatically with artificial tears, topical antihistamine drops and cold compresses, however the patients demand some treatment to shorten the course of illness and relieve symptoms. In a study conducted by Butt AL, the corneal subepithelial infiltrates lasted for about 45 days causing photophobia, blurring of vision and astigmatism.¹⁰ It was observed in our study as well where about 70% to 80% of SEIs lasted for about 30 days. Some of the ophthalmologists use topical steroids with the aim to shorten the duration and decrease patients discomfort.¹⁷ These drops make the patients comfortable however they are associated with a higher rate of recurrence of these SEIs and they also increase virus shedding there by prolonging the infectivity periods.^{18,19} Our study also showed that those patients who had used topical steroids showed relatively early resolution as compared to those who used cyclosporine drops, however it was observed that ultimately the corneal lesions resolved in both the groups. There are studies in which there was complete resolution of SEIs in patients who used cyclosporin eye drops.^{20,21} Our study also showed that recurrence of SEIs was lower in patients who used cyclosporine drops being only 4.5% as compared to 11.7% in steroid group. Lvinger et al in their study, compared the efficacy of cyclosporin eye drops and showed improvement in SEIs in 9 out of 12 patients who had

previously used topical steroid drops and were resistant to it.²² Similar results were seen in a study by Jeng et al on twelve eyes which have developed SEIs and were responsive to steroids drops but were resistant to tapering. After the initiation of cyclosporin drops, steroids could be successfully tapered without any recurrence.²³ Romanowisky et al showed in their study that use of topical steroids only improved patients' discomfort, however it did not shorten the course of illness, rather their prolonged use was associated with serious side effects like glaucoma, cataract and corneal thinning.¹³ We have also found in our study that cyclosporine eye drops are comparable to topical steroid drops in resolving the SEIs but has an added advantage of reduced recurrence rate.

Limitation of our study is the small sample size and single center trial.

CONCLUSION

Cyclosporine eye drops are a safe and effective treatment of epidemic keratoconjunctivitis related SEIs, with an added advantage of reduced incidence of recurrence.

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Author's Designation and Contribution

Abdul Rafe; Consultant ophthalmologist: *Critical appraisal, Drafting and actual write-up of the manuscript.*

Muhammad Tariq Munawar; Consultant Ophthalmologist: *Concepts, interpretation of data.*

