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# EFFICACY OF TOPICAL STEROIDS IN TREATING SEVERE VIRAL CONJUNCTIVITIS: A RANDOMIZED CONTROL TRIAL

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| **Dr Silka Gupta*** | MBBS, Department of Ophthalmology, Sawai Man Singh Medical College, Jaipur, Rajasthan, India. *Corresponding Author |
| **Dr Rajesh Goel** | MBBS, MS and DNB Ophthalmology, Professor, Department of Ophthalmology, Sawai Man Singh Medical College, Jaipur. |
| **Dr Sukriti Upadhyay** | MBBS, MS Ophthalmology, Assistant Professor, Department of Ophthalmology, Himalyan Institute of Medical Sciences, Dehradun. |

**ABSTRACT** **Background:** Viral conjunctivitis, commonly known as pink eye, is a major cause of ocular morbidity. While mild cases typically resolve without intervention, severe cases require medical treatment due to significant discomfort and potential complications. This study aims to evaluate the efficacy of topical steroids, which are often reserved for severe cases due to their potent anti-inflammatory effects, in the treatment of severe viral conjunctivitis. **Methods:** This randomized controlled trial included 50 patients with severe viral conjunctivitis, divided into two groups. Group A received 0.5% Moxifloxacin eye drops, 0.5% Carboxymethyl Cellulose eye lubricants, and cold compresses with oral analgesics as needed. Group B received the same treatment plus Loteprednol eye drops, a mild topical steroid. Treatment lasted for two weeks, with clinical reviews every three days to assess symptoms and monitor potential complications. **Results:** There was no significant difference in the age and sex distribution between the groups. Discomfort levels assessed on a four-point scale showed significant improvement in Group B over Group A on days 3 and 6 ($p<0.001$), suggesting an accelerated relief from symptoms. By day 14, both groups showed no significant difference in discomfort levels, indicating that steroids do not alter the long-term course of the viral infection. **Conclusion:** The addition of topical steroids to the standard treatment regimen for severe viral conjunctivitis can significantly improve short-term symptomatic relief. However, they do not influence the overall progression of the disease. This study supports the judicious use of steroids in severe cases, balancing efficacy with the potential for adverse effects.

**KEYWORDS :** viral conjunctivitis, topical steroids, Loteprednol, randomized control trial, ocular inflammation, symptomatic relief.

## INTRODUCTION

Conjunctivitis, frequently referred to as "pink eye," ranks as a primary cause of red-eye presentations in ophthalmological settings. This condition manifests through the inflammation of the conjunctival membrane, resulting in ocular discharge, foreign body sensation, and discomfort (1). Conjunctivitis is temporally classified into acute and chronic phases: symptoms subsiding within four weeks denote an acute episode, whereas persistence beyond this duration indicates a chronic condition (2).

The etiological classification of conjunctivitis delineates viral, bacterial, and allergic origins. Notably, viral conjunctivitis, predominantly incited by adenoviruses, accounts for approximately 80% of cases, marking it as the most widespread and infectious form (3, 4). While mild cases of viral conjunctivitis generally resolve spontaneously within 5 to 7 days without therapeutic intervention (1), severe manifestations necessitate medical treatment. The inflammation characteristic of viral conjunctivitis is postulated to underpin the majority of its symptoms, with topical steroids being the principal anti-inflammatory treatment employed in severe instances (6). However, their use is restricted to cases of significant severity due to the dualistic nature of benefits and risks associated with steroid therapy.

Prevailing literature, including studies by Everitt H. et al, suggests a paucity of definitive evidence supporting the efficacy of existing treatment modalities (5). Conversely, research by Mark R. Wilkins indicates that low-potency steroid eye drops can swiftly alleviate symptoms in severe viral conjunctivitis cases (7). This study aims to further investigate these findings and address the extant gaps in knowledge.

## MATERIALS AND METHODS

This prospective, comparative observational study enrolled 50 patients diagnosed with severe viral conjunctivitis. These patients were stratified into two equal groups. Group A received 0.5% Moxifloxacin eye drops administered four times daily, 0.5% Carboxymethyl Cellulose eye lubricants applied six times daily, and cold compresses supplemented with oral analgesics as needed. Group B was treated with a similar regimen as Group A, with the addition of Loteprednol eye drops, a mild steroid, used four times daily for the first week and then tapered according to clinical response. The treatment duration for both groups was two weeks, with a careful reduction of the steroid dosage in Group B to prevent exacerbations.

### Inclusion Criteria

Inclusion criteria were severe viral conjunctivitis with symptoms of eyelid swelling, conjunctival chemosis, and significant discomfort, along with an active or resolving upper respiratory tract infection (URTI) or preauricular lymphadenopathy.

### Exclusion Criteria

Exclusion criteria included:

1. Mild to moderate conjunctivitis.
2. Corneal involvement.
3. Loss to follow-up.
4. Pseudomembrane formation.
5. Age under 18 years.
6. History of glaucoma.
7. Dendritic ulceration.
8. Diagnosis of dry eye syndrome.
9. Subepithelial corneal infiltrates.

### Diagnosis

The diagnosis of viral conjunctivitis was established on a clinical basis, with criteria requiring the presence of URTI or preauricular lymphadenopathy.

### Clinical Review

Patients were monitored every three days from the initial presentation for one week, followed by a final review two weeks from the start of the study. Clinical evaluations included visual acuity, intraocular pressure measurements, and slit lamp examinations incorporating fluorescein staining. Discomfort was assessed using a four-point scale: 0 (none), 1 (mild), 2 (moderate), 3 (severe), and 4 (very severe).

## RESULTS

**Table 1: Age Distribution**

| | Group A | | Group B | | P value |
|---|---|---|---|---|---|
| | Mean | Std. Dev. | Mean | Std. Dev. | |
| Mean Age | 36.120 | 8.012 | 33.240 | 8.983 | 0.237 |

**Results :** The comparison of age distributions between the Group A and Group B groups showed no significant difference ($p = 0.237$).

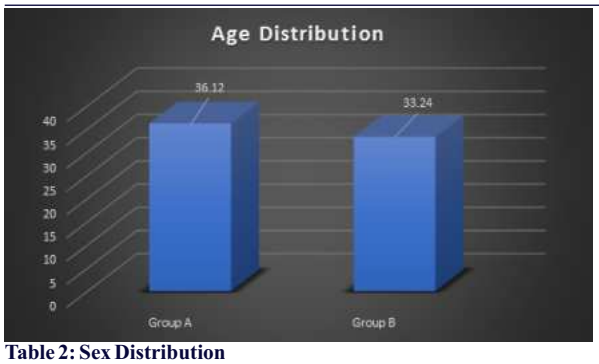


**Table 2: Sex Distribution**

| | Group A | | Group B | |
|---|---|---|---|---|
| | Number | Percentage | Number | Percentage |
| Female | 14 | 56.00 | 12 | 48.00 |
| Male | 11 | 44.00 | 13 | 52.00 |
| Total | 25 | 100.00 | 25 | 100.00 |

Chi-square = 0.080; P = 0.777

**Results :** Sex distribution analysis showed no significant difference between the Group A and Group B groups ($\chi^2 = 0.080$, $p = 0.777$).

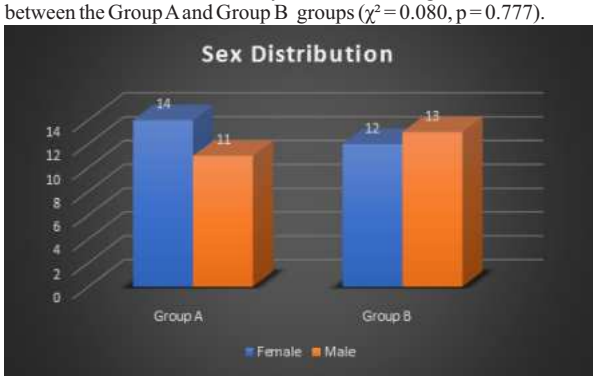


**Table 3: Patient Grading Of Their Discomfort At Review Visit**

| | | Group A (n=25) | | Group B (n=25) | |
|---|---|---|---|---|---|
| | | Number | Percentage | Number | Percentage |
| Day 0 | None 0 | 0 | 0.00 | 0 | 0.00 |
| | Mild 1 | 0 | 0.00 | 0 | 0.00 |
| | Moderate 2 | 0 | 0.00 | 0 | 0.00 |
| | Severe 3 | 4 | 16.00 | 6 | 24.00 |
| | Very Severe 4 | 21 | 84.00 | 19 | 76.00 |
| Day 3 | None 0 | 0 | 0.00 | 0 | 0.00 |
| | Mild 1 | 0 | 0.00 | 10 | 40.00 |
| | Moderate 2 | 7 | 28.00 | 13 | 52.00 |
| | Severe 3 | 15 | 60.00 | 2 | 8.00 |
| | Very Severe 4 | 3 | 12.00 | 0 | 0.00 |
| Day 6 | None 0 | 3 | 12.00 | 22 | 88.00 |
| | Mild 1 | 10 | 40.00 | 3 | 12.00 |
| | Moderate 2 | 11 | 44.00 | 0 | 0.00 |
| | Severe 3 | 1 | 4.00 | 0 | 0.00 |
| | Very Severe 4 | 0 | 0.00 | 0 | 0.00 |
| Day 14 | None 0 | 23 | 92.00 | 25 | 100.00 |
| | Mild 1 | 2 | 8.00 | 0 | 0.00 |
| | Moderate 2 | 0 | 0.00 | 0 | 0.00 |
| | Severe 3 | 0 | 0.00 | 0 | 0.00 |
| | Very Severe 4 | 0 | 0.00 | 0 | 0.00 |

**Table 4: Comparison Between Groups**

| | Group A | | Group B | | P value |
|---|---|---|---|---|---|
| | Median | IQR | Median | IQR | |
| Day 0 | 4 | {4-4} | 4 | {4-4} | 0.633 |
| Day 3 | 3 | {2-3} | 2 | {1-2} | p<0.001 |
| Day 6 | 1 | {1-2} | 0 | {0-0} | p<0.001 |
| Day 14 | 0 | {0-0} | 0 | {0-0} | 0.632 |

The results indicate significant differences between Group A and Group B across multiple days:

On Day 3, Group A had a median of 3 with an interquartile range (IQR) of 2-3, whereas Group B had a median of 2 with an IQR of 1-2. The p-value is less than 0.001, indicating a statistically significant difference between the two groups.

On Day 6, Group A had a median of 1 with an IQR of 1-2, while Group B had a median of 0 with an IQR of 0-0. Again, the p-value is less than 0.001, indicating a significant difference.

However, on Day 0 and Day 14, there were no statistically significant differences between the two groups, with p-values of 0.633 and 0.632 respectively.

## DISCUSSION

This randomized control trial aimed to assess the efficacy of topical steroids in the management of severe viral conjunctivitis, an inflammatory ocular condition with significant morbidity.[8] The findings from our study add to the ongoing discourse regarding the role of steroids in ocular viral infections, a topic that remains contentious due to the risks associated with steroid use, such as increased intraocular pressure and potential exacerbation of undiagnosed infections.[9,10]

The clinical outcomes observed in Group B, which received Loteprednol in addition to standard therapy, showed a significantly more rapid alleviation of symptoms compared to Group A, which did not receive steroid treatment.[11,12] Notably, the differences in discomfort levels between the two groups were statistically significant on Days 3 and 6, highlighting the short-term benefits of incorporating a mild topical steroid into the treatment regimen for severe cases of viral conjunctivitis. This aligns with findings from Wilkins et al., who reported that low-potency steroids could expedite symptom relief in similar patient cohorts.[13]

However, the efficacy of steroids must be balanced with their potential risks. Previous studies have highlighted the challenges of steroid use, including the possibility of prolonging viral shedding or worsening undetected secondary infections.[14] Our results underscore the importance of careful patient selection and monitoring, suggesting that steroids may be most beneficial when used judiciously in patients without risk factors for steroid complications.

Additionally, the lack of significant differences between groups on Day 0 and Day 14 suggests that while steroids may accelerate recovery, they do not affect the ultimate prognosis or long-term outcomes of the disease. This observation is crucial for setting patient expectations and guiding clinical decision-making. It suggests that while the addition of steroids to the treatment regimen may provide symptomatic relief, it does not alter the course of the underlying viral infection.[15]

This trial's strengths include its randomized design and the objective assessment of symptom relief through clinical evaluations. However, limitations include the small sample size and the short follow-up period, which might not fully capture long-term outcomes and potential complications related to steroid use.

## CONCLUSION

In conclusion, our study supports the controlled use of topical steroids in the treatment of severe viral conjunctivitis for immediate symptom relief. Future studies should focus on larger populations and longer follow-up periods to better understand the long-term implications of this treatment strategy, ensuring that the benefits outweigh the risks associated with steroid therapy.

## DECLARATION:

### Statement of Ethics:

Ethical approval taken for this study in accordance with local or national guidelines.

### Conflict Of Interest:

The authors have no conflicts of interest to declare.

### Funding sources:

No funding sources were used for this report.

### Data Availability Statement:

All data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author.

### Authors Contribution:

1. SG: gathering data, drafting, data analysis

2. RG: gathering data, drafting, reviewing
3. SU: gathering data, drafting

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