

## Original Research

### Short-term bactericidal potential of a steroid-antibiotic combination versus steroid in the treatment of conjunctivitis

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#### ABSTRACT:

**Background:** To assess the short-term bactericidal potential of a steroid-antibiotic combination versus steroid in the treatment of conjunctivitis. **Materials & Methods:** Enrolment of a total of 40 subjects was done for the current research. Complete demographic and clinical details of all the subjects was obtained. Random division of all the subjects was done as follows: Group A: Combination of neomycin sulphate, polymyxin-B sulphate with dexamethasone 0.1% and Group B: 0.1% dexamethasone. Baseline ocular signs and symptoms were recorded, and baseline bacterial cultures obtained from both eyes. Bacteriological samples were collected from both eyes, both baseline and post-dose. **Results:** Among the subjects of Group A, there has been significant reduction in the incidence of Gram-positive and negative species by approximately 70%. Among the subjects of Group B, none to minimal effect was seen in eradicating Gram-positive bacteria. There was a significant difference in reduction in clinical features in group A and B in respect to lacrimation, foreign body sensation, itching, photophobia, erythema, conjunctival discharge and bulbar conjunctiva hyperaemia from baseline to day 5. **Conclusion:** Use of a fixed dose combination steroid-antibiotic product was more effective for bacterial control and therapeutic efficacy in the treatment of conjunctivitis.

**Key words:** Conjunctivitis, Gram-positive bacteria, Erythema

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#### INTRODUCTION

Conjunctivitis affects many people and imposes economic and social burdens. It is estimated that acute conjunctivitis affects 6 million people annually in the United States.<sup>1, 2</sup> A majority of conjunctivitis patients are initially treated by primary care physicians rather than eye care professionals. Approximately 1% of all primary care office visits in the United States are related to conjunctivitis. Approximately 70% of all patients with acute conjunctivitis present to primary care and urgent care.<sup>1- 3</sup>

The prevalence of conjunctivitis varies according to the underlying cause, which may be influenced by the patient's age, as well as the season of the year. Viral conjunctivitis is the most common cause of infectious conjunctivitis both overall and in the adult population and is more prevalent in summer. Bacterial conjunctivitis is the second most common cause and

is responsible for the majority (50%-75%) of cases in children<sup>4</sup>; it is observed more frequently from December through April. Allergic conjunctivitis is the most frequent cause, affecting 15% to 40% of the population, and is observed more frequently in spring and summer.<sup>4- 6</sup>

Conjunctivitis can be divided into infectious and non-infectious causes. Viruses and bacteria are the most common infectious causes. Non-infectious conjunctivitis includes allergic, toxic, and cicatricial conjunctivitis, as well as inflammation secondary to immune-mediated diseases and neoplastic processes.<sup>5</sup> The present study was conducted to assess short-term bactericidal potential of a steroid-antibiotic combination versus steroid in the treatment of conjunctivitis.

## MATERIALS & METHODS

Enrolment of a total of 40 subjects was done for the current research. Complete demographic and clinical details of all the subjects was obtained. Random division of all the subjects was done as follows: Group A: Combination of neomycin sulphate, polymyxin-B sulphate with dexamethasone 0.1% and Group B: 0.1% dexamethasone. Baseline ocular signs and symptoms were recorded, and baseline bacterial cultures obtained from both eyes. Bacteriological samples were collected from both eyes, both baseline and post-dose. All the results were recorded

## RESULTS

Out of 40 subjects, 20 belonged to group A and remaining 20 belonged to group B. Mean age of the of group A and group B was 32.5 years and 35.4 years respectively. Majority of the subjects of both the groups were males. Among the subjects of Group A, there has been significant reduction in the incidence of Gram-positive and negative species by approximately 70%. Among the subjects of Group B, none to minimal effect was seen in eradicating Gram-positive bacteria. There was a significant difference in reduction in clinical features in group A and B in respect to lacrimation, foreign body sensation, itching, photophobia, erythema, conjunctival discharge and bulbar conjunctiva hyperaemia from baseline to day 5.

**Table 1: Distribution of bacteria**

Bacteria	Group A		Group B	
	Pre- treatment	Post- treatment	Pre- treatment	Post- treatment
<b>Gram positive</b>				
S. aureus	14	3	5	4
S. epidermidis	6	4	8	7
Streptococcus spp	3	0	3	2
Others	3	2	2	1
<b>Gram negative</b>				
H. Influenza	3	0	3	0
Neisseria spp	2	0	2	1
K. Pneumoniae	2	0	1	0
Others	3	1	2	1

## DISCUSSION

Conjunctivitis, also known as pink eye, is an inflammation of the conjunctiva. This is a protective membrane that covers the visible white part of the eye and the inner side of the eyelid. Conjunctivitis makes the affected eye(s) turn red. The inflammation is commonly caused by germs such as viruses or bacteria (infectious conjunctivitis). But it is also often caused by an allergy (allergic conjunctivitis). It often affects both eyes because the infection can easily spread from one eye to the other. To prevent this from happening, it's important to avoid touching an infected eye. If you do touch it, be sure to wash your hands right away. It is also a good idea to use your own towels and washcloths, and not share them with other people. Conjunctivitis is often caused by viruses or bacteria. Viral and bacterial conjunctivitis are both contagious. The germs are often transferred by touch, and the infection can spread from one eye to the other – for instance, if you touch both eyes with your fingers. But it can also spread through contact with objects such as eye drop bottles, tissues, washcloths or binoculars. Another common cause of conjunctivitis is allergic reactions – for instance, to pollen, animal fur or dust mites. Conjunctivitis can also be caused by dust or dirt, dry air, irritating liquids or damage to the conjunctiva. Sometimes the eye isn't kept moist enough with tear fluid, and that can lead to conjunctivitis too. If conjunctivitis is caused by an allergy or another external factor, it is not contagious.<sup>6- 8</sup>Hence; the present study was

conducted to assess short-term bactericidal potential of a steroid-antibiotic combination versus steroid in the treatment of conjunctivitis.

Out of 40 subjects, 20 belonged to group A and remaining 20 belonged to group B. Mean age of the of group A and group B was 32.5 years and 35.4 years respectively. Majority of the subjects of both the groups were males. Among the subjects of Group A, there has been significant reduction in the incidence of Gram-positive and negative species by approximately 70%. In a study conducted by Edward H et al, authors discussed the usefulness of topical ophthalmic corticosteroids and ophthalmic formulations that combine corticosteroids with anti-infectives/antibiotics for treating acute infectious conjunctivitis. A review of the published literature and relevant treatment guidelines. Topical corticosteroids are useful in treating ocular inflammation, but most treatment guidelines recommend steroid use generally in severe cases of conjunctivitis. This is partly due to risks associated with steroid use. These risks include potential for prolonging adenoviral infections and potentiating/worsening herpes simplex virus infections, increased intraocular pressure, glaucoma, and cataracts. Most of these perceived risks are not, however, supported by high-quality clinical data. They are also associated with long-term steroid uses that are dissimilar to applications for infectious conjunctivitis. Clinical data show that ophthalmic formulations that combine corticosteroids with broad-

spectrum anti-infectives could be effective and well tolerated when used for short-term treatment ( $\leq 2$  weeks). Corticosteroids, in combination with anti-infectives, could be a promising treatment option for acute conjunctivitis subject to development of further evidence on their effectiveness and safety in conjunctivitis treatment.<sup>9</sup>

Among the subjects of Group B, none to minimal effect was seen in eradicating Gram-positive bacteria. There was a significant difference in reduction in clinical features in group A and B in respect to lacrimation, foreign body sensation, itching, photophobia, erythema, conjunctival discharge and bulbar conjunctiva hyperaemia from baseline to day 5. Sharma S et al, in another study assessed short-term bactericidal potential of a steroid-antibiotic combination versus steroid in the treatment of conjunctivitis. 68 patients of conjunctivitis of both genders were divided into 2 groups of 34 each. Group I patients were given combination of neomycin sulphate 3500 IU/mL, polymyxin-B sulphate 6000 IU/mL with dexamethasone 0.1% and group II were given 0.1% dexamethasone. The symptoms evaluated included foreign body sensation, lacrimation, photophobia, and itching. Treatment in group I significantly reduced the incidence of Gram-positive and negative species by approximately 75%. Group II had none to minimal effects in eradicating Gram-positive bacteria. The difference was significant ( $P < 0.05$ ). There was significant difference in reduction in clinical features in group I and II in respect to lacrimation, foreign body sensation, itching, photophobia, erythema, conjunctival discharge and bulbar conjunctiva hyperaemia from baseline to day 4. The difference was significant.<sup>10</sup>

## CONCLUSION

From the above results, the authors conclude that use of a fixed dose combination steroid-antibiotic product was more effective for bacterial control and therapeutic efficacy in the treatment of conjunctivitis.

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