

Original Research

Assessment of short-term bactericidal potential of a steroid-antibiotic combination versus steroid in the treatment of conjunctivitis

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ABSTRACT:

Background: Conjunctivitis is a common eye condition that accounts for 1% of all primary care visits. 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:** 100 patients of conjunctivitis of both genders were divided into 2 groups of 50 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. Foreign body sensation, lacrimation, photophobia, and itching were assessed. **Results:** There were overall 42 males and 48 females. There was significant difference in reduction in symptoms in group I and II in relation to itching, photophobia, erythema, conjunctival discharge, bulbar conjunctiva hyperaemia, lacrimation, foreign body sensation from baseline to day 4. The difference was significant ($P < 0.05$). **Conclusion:** The use of a fixed dose combination steroid-antibiotic product was more efficient for bacterial control and therapeutic efficacy in the treatment of conjunctivitis.

Key words: Conjunctivitis, steroid, eye, antibiotic.

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INTRODUCTION

Conjunctivitis is characterized by inflammation and swelling of the conjunctival tissue, accompanied by engorgement of the blood vessels, ocular discharge, and pain. Many subjects are affected with conjunctivitis worldwide, and it is one of the most frequent reasons for office visits to general medical and ophthalmology clinics. More than 80% of all acute cases of conjunctivitis are reported to be diagnosed by non-ophthalmologists including internists, family medicine physicians, pediatricians, and nurse practitioners.¹ This imposes a great economic burden to the healthcare system and occupies a great proportion of the office visits in many medical specialties. It is estimated that the cost of treating bacterial conjunctivitis is \$857 million annually in the United States alone.²

There are several ways to categorize conjunctivitis; it may be classified based on etiology, chronicity, severity, and extent of involvement of the surrounding tissue. The etiology of conjunctivitis may

be infectious or non-infectious. Viral conjunctivitis followed by bacterial conjunctivitis is the most common cause of infectious conjunctivitis, while allergic and toxin-induced conjunctivitis are among the most common non-infectious etiologies. In terms of chronicity, conjunctivitis may be divided into acute with rapid onset and duration of four weeks or less, subacute, and chronic with duration longer than four weeks.³

Maxitrol is a multiple dose ophthalmic suspension containing neomycin and polymyxin B sulphates and dexamethasone, whereas Maxidex contains dexamethasone alone.⁴ Neomycin sulphate has a wide antibacterial spectrum primarily against gram-positive organisms, but is often inactive against gram-negative pathogens including *Pseudomonas aeruginosa*. Polymyxin B sulphate is active against *Pseudomonas aeruginosa* and other gram-negative organisms. It has been a consensus that of all the combined therapies, combinations of antibiotics and steroid eye drops is undesirable for more than one reason. Antibiotic

therapy where not indicated has the disadvantage that the patient may develop resistance to the drug and may not respond when antibiotic is urgently needed. The combination of neomycin and polymyxin B is considered to be synergistic.⁵

Hence, this study was conducted to assess the short-term bactericidal potential of a steroid-antibiotic combination versus steroid in the treatment of conjunctivitis.

MATERIAL AND METHODS

Both male and female conjunctivitis patients totalling 100 were split into two groups of 50 each. Neomycin sulphate 3500 IU/mL, polymyxin-B sulphate 6000 IU/mL, and dexamethasone 0.1% were administered to group 1 patients, and 0.1% dexamethasone was

given to group 2 patients. Itching, lacrimation, photophobia, and a sense of a foreign body were evaluated. Names, ages, genders, and other information were recorded. There were two groups of 50 patients each. Neomycin sulphate 3500 IU/mL, polymyxin-B sulphate 6000 IU/mL, and dexamethasone 0.1% were administered to group I patients, and 0.1% dexamethasone was given to group II patients. All patients had baseline ocular symptoms and signs noted, and both eyes had bacterial cultures taken. Both eyes were used to gather bacterial samples. The itching, lacrimation, foreign body sensation, and photophobia parameters were noted. Thusly obtained results were statistically analysed. P value under 0.05 was regarded as significant.

RESULTS

Table 1: Gender-wise distribution of subjects

Gender	Number of subjects
Males	42
Females	48
Total	50

There were 42 males and 48 females in all.

Table 2: Assessment of symptoms

Symptoms	Group 1		Group 2		P-value
	Baseline	Day 4	Baseline	Day 4	
Itching	1.23	1.09	1.19	1.02	0.04
Photophobia	2.63	1.02	2.59	0.69	
Erythema	2.96	0.43	2.68	0.43	
Conjunctival discharge	0.72	0.11	0.57	0.37	
Bulbar conjunctiva hyperaemia	2.3	0.96	1.8	0.66	
Lacrimation	1.57	0.61	1.43	0.44	
Foreign body sensation	1.7	0.9	1.9	1.2	

There was significant difference in reduction in symptoms in group I and II in relation to itching, photophobia, erythema, conjunctival discharge, bulbar conjunctiva hyperaemia, lacrimation, foreign body sensation from baseline to day 4. The difference was significant ($P < 0.05$).

DISCUSSION

Acute and chronic superficial ocular inflammation of bacterial origin is a common problem characterized by irritation, itching, and burning of the eyelids. The accompanying presence of dry or greasy scales on the upper and lower lid margins, in addition to alterations of the ocular surface, is a direct consequence of bacterial colonization and the secondary immune mediated phenomena. Chronic cases, especially blepharitis, can persist for periods of years, requiring prolonged therapy.⁶ Mild bacterial conjunctivitis typically resolves spontaneously, but topical antibacterial therapy is generally preferred as it is associated with a shorter infectious period and earlier resolution of clinical signs and symptoms.⁷ Allergic conjunctivitis is typically treated with antihistamines and mast cell stabilizers, but if the symptoms persist, therapy may be supplemented with topical corticosteroids.

Hence, this study was conducted to assess the short-term bactericidal potential of a steroid-antibiotic

combination versus steroid in the treatment of conjunctivitis.

In this study, there were overall 42 males and 48 females. There was significant difference in reduction in symptoms in group I and II in relation to itching, photophobia, erythema, conjunctival discharge, bulbar conjunctiva hyperaemia, lacrimation, foreign body sensation from baseline to day 4. The difference was significant ($P < 0.05$).

In a study by D G Shulman et al⁸, the effects of four days' treatment with topical Maxitrol (neomycin sulphate 3500 IU/mL, polymyxin-B sulphate 6000 IU/mL with dexamethasone 0.1%) were compared with those of Maxidex (dexamethasone 0.1% alone) in a double-masked study in 111 patients with bacterial blepharitis or conjunctivitis, 95 of whom were evaluable for efficacy. The majority of patients ($N = 80$) had chronic blepharitis. Maxitrol treatment resulted in a significantly greater reduction (90%) in bacterial counts and bacterial eradication (50%) compared with Maxidex (34% and 17% respectively).

Maxitrol treatment also produced a significantly greater reduction in conjunctival discharge than did Maxidex, while the treatments were equally effective in alleviating other ocular signs and symptoms. It was concluded that use of a fixed dose combination steroid-antibiotic product was more effective for bacterial control and therapeutic efficacy in the treatment of chronic blepharitis and conjunctivitis patients than treatment with steroid alone.

J J van Endt et al⁹ performed this prospective, randomised, investigator-masked, parallel-group study to compare Fluorometholone-Gentamicin eye drops with Maxitrol (dexamethasone, neomycin, polymyxin B) eye drops in the reduction of ocular bacterial flora and control of ocular inflammation after cataract surgery. One hundred and twelve (FML-Genta 54, Maxitrol 58) patients of both sexes undergoing cataract and posterior chamber lens implant surgery for visually disabling cataract were enrolled in the study and examined pre-operatively and post-operatively on days 1, 6-8 and 24-34. The baseline parameters were similar in the two study groups. The conjunctival bacterial colony count on day 6-8 post-operatively was significantly less on FML-Genta compared with Maxitrol ($p = 0.033$). There was no statistically significant difference between the two treatments in the degree of intra-ocular inflammation as assessed by flare and cells in the anterior chamber. Both treatments were judged to be equal in the global assessment of the success of therapy and local tolerance by the study patients and doctors. Fluorometholone-gentamicin eye drops were more effective than Maxitrol eye drops in the reduction of ocular bacterial flora while being as well-tolerated and as effective as Maxitrol in the control of ocular inflammation after cataract surgery.

CONCLUSION

The use of a fixed dose combination steroid-antibiotic product was more efficient for bacterial control and therapeutic efficacy in the treatment of conjunctivitis.

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