

A Comparative Study on Efficacy of Ciprofloxacin with Tobramycin Ophthalmic Solution in Acute Conjunctivitis

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Abstract

Acute conjunctivitis (AC) is a common disease in both developing and industrialized countries. Conjunctivitis is an inflammation of the conjunctiva usually occurs as a result of infection or allergy, resulting in a so-called “red eye” or “pink eye.” Acute conjunctivitis can be viral in nature; however, as many as 78% of cases in children and half of cases in adults are caused by bacteria. Worldwide, there are an estimated 5 million cases of neonatal infectious conjunctivitis per year. It is usually a benign, self-limited condition. Two drugs though from different groups, both exerting antimicrobial action and are extensively used in acute bacterial conjunctivitis in Nepal Medical College. It will therefore be of interest to know the difference between the efficacies of these two widely utilized drugs. Ciprofloxacin ophthalmic solution (fluoroquinolones) and Tobramycin ophthalmic solution (aminoglycosides), which are the most commonly used as topical antimicrobial agent in context of Nepal.

Keywords: Ciprofloxacin; Acute Conjunctivitis; Nepal

Introduction

- Defined as conjunctivitis with symptoms of less than 3–4 weeks duration, and is the eye disorder most commonly seen by a general practitioner
- *Neisseria gonorrhoeae* is the most frequent cause of hyperacute bacterial conjunctivitis.
- Acute conjunctivitis can be viral in nature; however, as many as 78% of cases in children and half of cases in adults are caused by bacteria.
- Worldwide, there are an estimated 5 million cases of neonatal infectious conjunctivitis per year.
- Various classes of antibiotics have been used including aminoglycosides, polymyxin B combinations, macrolides, sulfonamides in acute conjunctivitis
- The rationale behind the use of either ciprofloxacin or tobramycin ophthalmic solution is; they are broad spectrum antimicrobials which are active against gram positive and gram negative bacteria.
- Two drugs though from different groups, both exerting antimicrobial action and are extensively used in acute bacterial conjunctivitis in Nepal Medical College.

- Thus, it is planned to compare the efficacy of two topical antimicrobial agents: ciprofloxacin ophthalmic solution and tobramycin ophthalmic solution, which are the most commonly used as topical antimicrobial agent in context of Nepal.

Methodology

- A prospective study was conducted from January 2018 to August 2019. Each of the patients was assigned with a serial number in terms of lottery system.
- All the patients were randomized into two groups: Group A and Group B.
- Group A patients received Ciprofloxacin ophthalmic solution.
- Group B patients received Tobramycin ophthalmic solution.
- In both groups, length of infected days, intended drug prescribed were recorded.

Follow up of the cases

- Follow up for mild, moderate and severe cases were done after 3 days, 5 days and 7 days.
- Acute bacterial conjunctivitis before and after treatment were determined using sign and symptoms scoring scales.

- Sign and symptoms scoring scale consist of hyperemia, conjunctival discharge, congestion and bulbar conjunctival injection.
- The used sign and symptoms scale help to determined the different severity of disease (absent, mild, moderate and severe) and also scores (0, 1, 2 and 3). A response of 'none' is scored as '0', mild-1, moderate-2, severe-3.
- A decrease in the clinical signs and symptoms to a total severity score 0 or 1 will be considered as clinical cure.

Statistical analysis

- All the collected data were entered in and statistical analysis carried out using Statistical Package for Social Sciences (SPSS) version 20. The data was analyzed for age, sex and cure rates.
- Results were expressed as mean ± standard deviation. Descriptive statistics like Chi-square test were used to analyze socio-demographic data.
- Different statistical test of significance like pair t test and independent sample t test were applied to find the p value.
- Cure rates at the end of 7 days for mild cases were compared by using Non parametric Mcnemar test.

Age and gender wise distribution of conjunctivitis patients

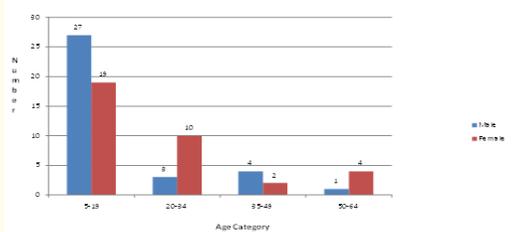


Figure 1

Sign and symptoms score before and after treatment in ciprofloxacin group (Day 1) Treatment for mild, moderate and severe cases

Drug group	Sign and symptoms score		p value
	Before treatment	After treatment	
Ciprofloxacin	1.86 ± 0.73	0.43 ± 0.61	<0.001

Figure 2

Sign and symptoms score before and after treatment in Tobramycin group (Day 1) Treatment for mild, moderate and severe cases

Drug group	Sign and symptoms score		p value
	Before treatment	After treatment	
Tobramycin	1.74 ± 0.70	0.57 ± 0.74	<0.001

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8

Figure 9

Discussion

- In the present study, comparative clinical efficacy of ciprofloxacin with tobramycin ophthalmic solution in acute conjunctivitis was attempted by using sign and symptoms score.
- This prospective study was conducted in Department of Ophthalmology, NMCTH, Jorpati, Kathmandu from January 2018 to August 2019.

- A total of 70 patients of either suffering from acute bacterial conjunctivitis were studied. The data obtained was statistically analyzed.
- The main objective of this study was to find the efficacy of two study drugs ciprofloxacin and tobramycin in acute bacterial conjunctivitis.
- However, socio demographic data collected was analyzed. In the present study, it is observed that male and female patients were equally affected.
- There was no statistically significant difference ($p>0.05$) in gender wise distribution of acute conjunctivitis in two drug groups.
- In the study, it is observed that the number of acute bacterial conjunctivitis patients were higher in children of the age group 5-19 years (46 patients).
- The mean age of the patients was 19.63 ± 15.49 years (range 5-64 years).
- In the present study, the sign and symptoms scores are categorized as mild, moderate and severe according to severity of diseases.
- Follow up for mild, moderate and severe cases were done after 3 days, 5 days and 7 days. In mild cases, all 12 patients in ciprofloxacin and 14 patients in tobramycin were clinically cured at day 7.
- In moderate cases, out of 16 patients, 15 were cured in ciprofloxacin group whereas out of 16 patients, 14 were cured in tobramycin group at day 5.
- The mean sign and symptoms score between two study drugs were compared; no statistically significant reduction ($p>0.05$) was observed.
- In severe cases, out of 7 patients, 6 were cured in ciprofloxacin group whereas out of 5 patients, 2 were cured in tobramycin group at 7 days.
- At day 3 for severe patients, the mean sign and symptoms score between study drugs were compared; no statistically significant reduction ($p>0.05$) was observed.
- However, at day 7th for same patients, the mean sign and symptoms score between two study drugs were compared; statistically significant reduction was observed ($p<0.05$).
- This study showed that both study drugs were equally effective in mild cases. But in moderate and severe cases, ciprofloxacin is more effective than tobramycin.
- The results were equivocal as no such earlier studies were found [1-15].

Conclusion

- It was a prospective, randomized hospital based study and the efficacy of drugs under study was evaluated by using cure rates in both groups of treatment
- The result of this study indicates that acute bacterial conjunctivitis is more common in children than adults.
- Male and female were equally affected.
- Both study drugs were effective in the treatment of acute bacterial conjunctivitis

But the cure rates were significantly higher in ciprofloxacin group as compared to tobramycin group

Limitation

- In this study, sample size was small. Therefore, multicenter studies with large sample size are required.

Recommendation

- This study was not designed to find the association of socio-demographic factors with acute bacterial conjunctivitis.
- Studies are required to find the association. This study was not based on microbiological cure rates.
- So, further studies are warranted to assess both clinical and microbiological cure rates.
- This study comprises the patients suffering from acute bacterial conjunctivitis.

However, patients of viral conjunctivitis can be taken into consideration in other studies.

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