



Assessment of efficacy of Topical ofloxacin compared with gentamicin in the treatment of external ocular infection: a comparative study

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Abstract

Background: External ocular infection can be bacterial, viral, or fungal. Viral ocular infections are often self-limiting. Therapy may reduce symptoms but does not affect the clinical course of viral external ocular infection. Hence; we planned the present study to compare the efficacy of topical ofloxacin compared with gentamicin in the treatment of external ocular infection.

Materials and Methods: The study was conducted in the Department of Ophthalmology of the MGM MEDICAL College and LSK Hospital, Kishanganj, from July 2016 -July 2017. For the study, a total of 100 patients with suspected external ocular bacterial infection were selected. A detailed informed consent was obtained from the patients. The patients were randomly grouped into two groups, Group 1 and Group 2. Subjects in group 1 were given topical Ofloxacin for application on the eye with external ocular infection. Subjects in group 2 were given topical Gentamicin for application on the eye with external ocular infection.

Results: There were total of 50 patients in each group. Number of male patients in group 1 was 32 and in group 2 was 35. Number of female patients in group 1 was 18 and in group 2 was 15. The mean age of patients in group 1 was 42.82 years and in group 2 was 51.33 years. In group 1, clinical improvement was seen in 42 patients and microbiological improvement was noticed in 40 patients. In group 2, clinical improvement was seen in 45 patients and microbiological improvement was noticed in 42 patients.

Conclusion: From the results of present study, we conclude that topical Ofloxacin and Gentamicin are both equally efficacious in treatment of external ocular infection.

Keywords: External ocular, internal ocular, bacterial infection, Ofloxacin.

Introduction

Origin of external ocular infections could be viral, fungal or bacterial in nature. Nature of viral infections is usually self-limiting. Treatment of these viral lesions is usually symptomatic in nature, which doesn't affect the clinical course and duration of the disease. Even though bacterial infections could also be self-limiting sometimes, topical formulation of antibiotics might be applied

as a solution, suspension, or ointment for a week, and quite often, the clinical course of the bacterial infections is shortened by these topical antibiotics. These antibiotics also control the spread of infection.^{1, 2} Common bacteria responsible for causation of bacterial infections are Haemophilus influenzae, Streptococcus pneumoniae, Staphylococcus aureus, and Moraxella catarrhalis. Among paediatric subjects, the more common

pathogens are *H. influenza* and *S. pneumoniae*, whereas among adults, the more common pathogens are *S. aureus* and *H. influenza*.^{3- 5} Against gram negative organisms, the efficacy of fluoroquinolones is very high, however; against gram-positive organisms, their efficacy is not reliable. Bacitracin and chloramphenicol demonstrated good in vitro activity against gram-positive organisms. The overall relative in vitro efficacy is as follows (descending order): chloramphenicol, ciprofloxacin, ofloxacin, norfloxacin, bacitracin, tetracycline, neomycin, erythromycin, tobramycin, and gentamicin. No antibiotic demonstrated 100% coverage.⁶ Hence, the present study is planned to compare the efficacy of topical ofloxacin compared with gentamicin in the treatment of external ocular infection.

Materials and Methods

The study was conducted in the Department of Ophthalmology of the MGM MEDICAL College and LSK Hospital, Kisanganj. The ethical clearance for the study was obtained from the ethical committee of the institute prior to commencement of the study. For the study, a total of 100 patients with suspected external ocular bacterial infection were selected. A detailed informed consent was obtained from the patients. Patients who were allergic to any of the drug or constituents of the medication were removed from the study. The patients were randomly grouped into two groups, Group 1 and Group 2. Subjects in group 1 were given topical Ofloxacin for application on the eye with external ocular infection. Subjects in group 2 were given topical Gentamicin for application on the eye with external ocular infection. One drop of the medication was applied to the affected eye(s) six times daily (every 2 to 4 hours) for 2 days (day 1 and day 2) and then four times daily for the next 8 days (day 3 to day 10). The first dose was administered by the investigator, and all subsequent doses were self-administered by the patient. The patients were recalled after 10 days.

The clinical symptoms were assessed of each patient. The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student’s t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistical significant.

Results

Table 1 shows demographic data of the patients. There were total of 50 patients in each group. Number of male patients in group 1 was 32 and in group 2 was 35. Number of female patients in group 1 was 18 and in group 2 were 15. The mean age of patients in group 1 was 42.82 years and in group 2 was 51.33 years. Table 2 shows improvement noticed in Group 1 and Group 2. In group 1, clinical improvement was seen in 42 patients and microbiological improvement was noticed in 40 patients. In group 2, clinical improvement was seen in 45 patients and microbiological improvement was noticed in 42 patients.

Table 1: Demographic data

Variables	Group 1	Group 2
No. of patients	50	50
Sex:		
• Male	32	35
• Female	18	15
Mean age (years)	42.82	51.33

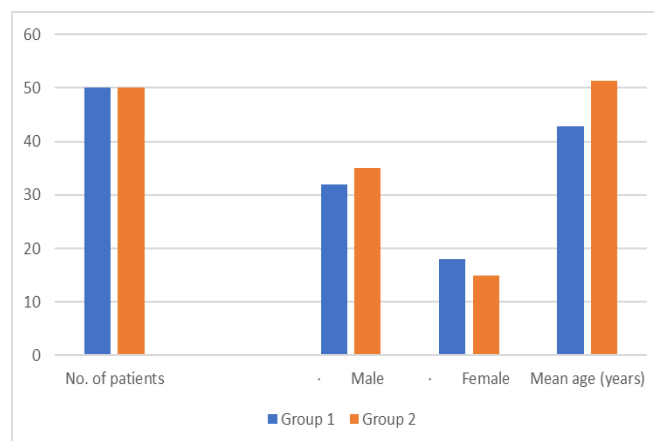


Fig 1: Demographic data

Table 2: Improvement noticed in Group 1 and Group 2

	Number of patients with improvement		
	Clinical improvement	Microbiological improvement	Overall
Group 1	42/50	40/50	40/50
Group 2	45/50	42/50	42/50

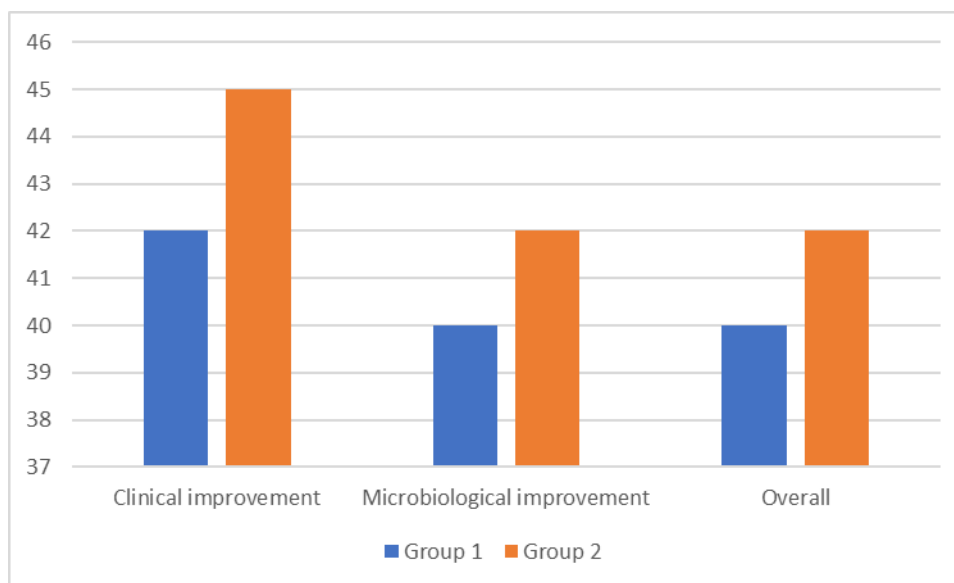


Fig 2: Improvement noticed in Group 1 and Group 2

Discussion

In the present study, we observed that Ofloxacin and Gentamicin are both efficacious in treatment of extra ocular infections. We observed that clinical improvement and microbiological improvement seen in both groups are comparable. The results were compared to previous studies and results were seen to be consistent. In one of the previous study conducted by Miller IM et al, authors assessed 488 patients which showed clinical sign and symptoms of acute bacterial conjunctivitis or blepharitis, or both. They divided all the patients broadly into two study groups with 245 patients in one group and 243 patients in another group; One group included patients that were given norfloxacin ophthalmic solution 0.3%, while other group included patients that were given gentamicin ophthalmic solution 0.3%. Therapy in both the study groups was given for 7 days’ time. In the norfloxacin group, clinical efficacy of the antibiotic solution came to be 71 percent while in the gentamicin group; the clinical efficacy of the antibiotic came out to be 65 percent. A significant clinical improvement also

occurred twenty five percent of the patients of the norfloxacin group and thirty two percent patients of the gentamicin group respectively. Based on the results of post-therapy cultures, eighty nine percent of all cultured bacteria were eliminated or inhibited after treatment with norfloxacin. No clinical improvement was seen in 5 norfloxacin treated patients. However; in the gentamicin treated group, no clinical improvement was seen in 8 gentamicin-treated patients. Under the light of obtained results, they concluded that against spectrum of bacterial infections, Norfloxacin appeared to be a safer antibiotic. In another study conducted by Gwon A et al, authors comparatively assessed the effectiveness of 0.3% ofloxacin solution with those of 0.3% gentamicin ophthalmic solution in curing external bacterial ocular infections. Clinical cure rate among the patients of the ofloxacin group was found to be 98 percent, while clinical cure rate among the patients of the gentamicin group was found to be 92 percent. Microbiological cure rate among the patients of the ofloxacin group was found to be seventy eight percent, while it was sixty seven

percent among the patients of the gentamicin group respectively. However; in spite of the alteration in the curing rate in the two study groups, the results observed by the authors was not statistically significant.^{7, 8} In another previous study,

Bron AJ et al investigated the efficacy of 0.3% ofloxacin and 0.5 percent chloramphenicol in treating bacterial ocular infections. In eighty four culture positive patients, they investigated the clinical and microbiological treatment improvement rate. No difference was observed by the authors in between the two drugs in terms of clinical improvement rate. In another study conducted by Leibowitz HM et al, authors comparatively evaluated the efficacy of tobramycin and gentamicin ophthalmic ointment in the treatment of superficial external eye disease. Assessment of a total of 77 patients diagnosed with suffering from blepharitis and/or conjunctivitis was done. After meeting the inclusion and exclusion criteria, the sample size of their study was reduced to 56 patients. Clinical improvement was seen in ninety seven percent patients of the tobramycin group, while it was seen in approximately ninety one patients of the gentamicin group. Their results presented that in comparison to gentamicin, tobramycin was a clinically effective and safe topical antibiotic.^{9, 10}

Conclusion

From the results of present study, we conclude that topical Ofloxacin and Gentamicin are both equally efficacious in treatment of external ocular infection.

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