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Original Article

Assessment of Efficacy of Different Antibiotics in Treating Patients with Ocular Infection

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ABSTRACT:

Background: Infection of the eye leads to conjunctivitis, keratitis, endophthalmitis, dacryocystitis, blephritis, infections of eye lid, microbial scleritis, canaliculitis, preseptal cellulitis, orbital cellulitis, endophthalmitis and panophthalmitis etc., which are responsible for increased incidence of morbidity and blindness worldwide.Under the light of above mentioned data, we planned the present study to assess the efficacy of two different antibiotics in treating patients with ocular infection. **Materials & methods:** The present study included assessment of efficacy of different antibiotic therapy in treating patients with ocular infection. A total of 50 patients with external ocular infections were included in the present study. All the patients were broadly divided into two study groups as follows: Group A: included patients who were treated with 0.3% ofloxacin solution for seven days,Group B: included patients who were treated with 0.5% chloramphenicol solution for seven days. Clinical and microbiological characterization of all the patients was done by obtaining swab from the margin of the eyelid. Clinical and microbiological cure in all the patients was assessed. All the data were summarized in Microsoft excel sheet and were analyzed by SPSS software. **Results:** Clinical improvement occurred in 100 percent of cases in group A while it occurred in 96 percent of the cases respectively. Microbiological improvement was seen in 22 and 23 cases of group A and group B respectively. Overall, improvement rate among subjects of group A and group B was similar (88 percent). **Conclusion:** Both the antibiotic regimes can be used with equal efficacy in treating patients with ocular infections. However; further studies are recommended.

Key words: Antibiotics, Infection, Ocular

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INTRODUCTION

Infection of the eye leads to conjunctivitis, keratitis, endophthalmitis, dacryocystitis, blephritis, infections of eye lid, microbial scleritis, canaliculitis, preseptal cellulitis, orbital cellulitis, endophthalmitis and panophthalmitis etc., which are responsible for increased incidence of morbidity and blindness worldwide.[1-3] Normally the eye is impermeable to most environmental agents. Continuous tear flow, aided by the blink reflex, mechanically washes substances from the ocular surface and prevents the accumulation of microorganisms. In addition, lysozyme, lactoferrin, secretory immunoglobulins, and defensins, which are present at high levels in tears, can specifically reduce bacterial colonisation of the ocular surface.[4-6] Exogenous endophthalmitis is an infective complication of primary cataract, intraocular surgery and ocular trauma due to the introduction of infectious pathogens like bacteria whereas the endogenous one is commonly due to systemic dissemination of the pathogens. Both keratitis and endophthalmitis are potentially devastating ocular infections if not diagnosed early.[7-9]

Broad-spectrum antibiotics should be administered to the appropriate site of infection as soon as a diagnosis is made. Topical drops are preferred for corneal and conjunctival infections. Intravitreal antibiotics, and possibly subconjunctival and parenteral antibiotics, are preferred for endophthalmitis. Parenteral antibiotics are recommended for infection in deep adnexal structures.[10, 11]

Under the light of above mentioned data, we planned the present study to assess the efficacy of two different antibiotics in treating patients with ocular infection.

MATERIALS & METHODS

The present study was conducted in the department of ophthalmology of the medical institute and it included assessment of efficacy of different antibiotic therapy in treating patients with ocular infection. Written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 50 patients with external ocular infections were included in the present study. All the patients were broadly divided into two study groups as follows:

Group A: included patients who were treated with 0.3% ofloxacin solution for seven days,
Group B: included patients who were treated with 0.5% chloramphenicol solution for seven days.

Complete clinical and demographic details of all the patients were obtained. Clinical and microbiological characterization of all the patients was done by obtaining swab from the margin of the eyelid. Clinical and microbiological cure in all the patients was assessed. All the data were summarized in Microsoft excel sheet and were analyzed by SPSS software. Chi- square test was used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

RESULTS

50 patients with ocular infections were included in the present study and were broadly divided into two study groups; group A and group B. Mean age of the patients of group A and group B was 33.5 and 35.1 years respectively. There were 10 patients less than 20 years of age in Group A and 12 patients less than 20 years of age in group B. There were 12 and 13 males in group A and group B respectively. Clinical improvement occurred in 100 percent of cases in group A while it occurred in 96 percent of the cases respectively. Microbiological improvement was seen in 22 and 23 cases of group A and group B respectively. Overall, improvement rate among subjects of group A and group B was similar (88 percent).

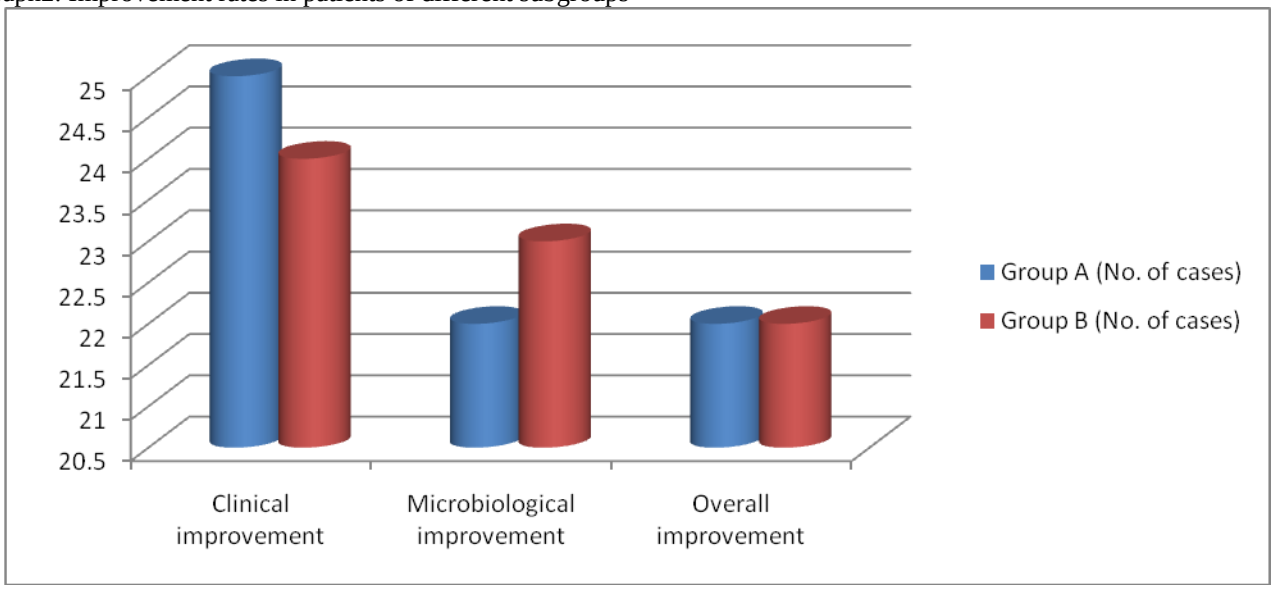
Table 1: Comparison of demogprahic data

Parameter		Group A (No. of cases)	Group B (No. of cases)
Age group	Less than 20 years	10	12
	20 to 40 years	5	6
	More than 40 years	10	7
Gender	Male	12	13
	Females	13	12
Total		25	25

Table 2: Comparison of improvement rates in patients of different subgroups

Improvement	Group A (No. of cases)	Group B (No. of cases)	P- value
Clinical improvement	25	24	0.51
Microbiological improvement	22	23	
Overall improvement	22	22	

Graph2: Improvement rates in patients of different subgroups



DISCUSSION

In the present study, 50 patients with ocular infections were included in the present study and were broadly divided into two study groups; group A and group B. Mean age of the patients of group A and group B was 33.5 and 35.1 years respectively. There were 10 patients less than 20 years of age in Group A and 12 patients less than 20 years of age in group B. There were 12 and 13 males in group A and group B respectively. Wang N et al compared the differences of microbial spectrum and antibiotic resistance patterns between external and intraocular bacterial infections in an eye hospital in South China. A total of 737 bacteria isolates from suspected ocular infections were included in this retrospective study covering the period 2010–2013. The organisms cultured from the ocular surface (cornea, conjunctiva) accounted for the majority of the isolates (82.77%, n = 610), followed by the intraocular (aqueous humor, vitreous fluid), which accounted for 17.23% (n = 127). The top three species accounting for the external ocular infections were S. epidermidis (35.25%), P. aeruginosa (8.03%), and S. simulans (4.43%). The top three species for the intraocular infections were S. epidermidis (14.96%), S. hominis (8.66%), and B. subtilis (7.87%). The bacteria from the external ocular surface were more sensitive to neomycin, while those from the intraocular specimens were more sensitive to levofloxacin ($P < 0.01$). Multidrug resistance was found in 89 bacteria (12.08%), including isolates from both external (13.28%) and intraocular samples (6.30%). The results of this study indicate that the bacteria spectrum of external and intraocular infections is variable in the setting. A high percentage of bacterial organisms were found to be primarily susceptible to neomycin for external infection and levofloxacin for intraocular infection.[12]Gwon A et al compared the effectiveness and safety of 0.3% ofloxacin solution with those of 0.3% gentamicin ophthalmic solution in treating external bacterial ocular infections. The clinical improvement rate for patients treated with ofloxacin was 98% (51/52) and 92% (48/52) for those treated with gentamicin. Microbiological improvement was achieved in 78% (40/51) of the ofloxacin patients, compared with 67% (35/52) of the gentamicin group. Ofloxacin treatment eradicated or controlled 85% (86/101) of the Gram positive and 89% (17/19) of the Gram negative organisms cultured, compared with 83% (103/124) and 78% (29/37), respectively, after gentamicin treatment. None of these differences were statistically significant. The incidence of adverse effects attributable to ofloxacin treatment (3.2%) was less than that reported for gentamicin (7.1%). Ofloxacin proved to be an effective, safe, and comfortable therapy for external bacterial ocular infection.[13]

In the present study, clinical improvement occurred in 100 percent of cases in group A while it occurred in 96 percent of the cases respectively. Microbiological improvement was seen in 22 and 23 cases of group A and group B respectively. Overall, improvement rate among subjects of group A and group B was similar (88 percent).Bron AJ et al compared the safety and efficacy of 0.3% ofloxacin in treating bacterial ocular infections with that of 0.5% chloramphenicol in a parallel-group, randomised clinical trial at five sites. Clinical and microbiological improvement rates were studied in 84 culture-positive patients. Patients with suspected bacterial ocular infections were evaluated for clinical improvement and were included in drug safety and comfort analyses. Clinical improvement did not differ significantly between drug treatments. All patients completing the study (79 assigned ofloxacin, and 74 chloramphenicol) showed clinical improvement. Clinical improvement in the culture-positive groups was 100% (41/41) after ofloxacintreatment, and 95% (41/43) after chloramphenicol treatment. Microbiological improvement rates were similar for the two drugs: 85% (33/39) improved with ofloxacin, and 88% (38/43) improved with chloramphenicol. Both drugs were well tolerated. Adverse reactions possibly due to the study medication occurred in 1% (1/89) of those who received ofloxacin, and in 4% (4/93) of those who received chloramphenicol.[14]Constantinou M et aldetermined the clinical efficacy and safety of moxifloxacin (1.0%) in patients with bacterial keratitis compared with patients treated with ofloxacin (0.3%) or fortified tobramycin (1.33%)/cephazolin (5%). A total of 229 patients diagnosed with bacterial keratitis were enrolled in the study; 78 patients were randomized to the fortified tobramycin/cephazolin group, 77 patients to the moxifloxacin group, and 74 patients to the ofloxacin group. A total of 225 patients were evaluable for safety and 198 patients were included in the efficacy analysis. After corneal specimens were obtained, the assigned study medication was instilled every hour, day and night, for 48 hours and on the third day, every hour by day and every 2 hours at night. For days 4 and 5, 1 drop every 2 hours by day and every 4 hours at night, and for days 6 and 7, 1 drop every 4 hours. After day 7, the antibiotic was tapered to every 6 hours and stopped when appropriate. Resolution of keratitis and healing of ulcer, time to cure, mean time to discharge, clinical sign score, adverse reactions to study medication, and treatment failures. No difference in healing rate, cure rate, or complications between fortified cephazolin and tobramycin, ofloxacin, or moxifloxacin was seen in this study.[15]

CONCLUSION

Under the light of above mentioned data, the authors concluded that both the antibiotic regimes can be used with equal efficacy in treating patients with ocular infections. However; further studies are recommended.

REFERENCES

1. Chirambo MC, Tielsch JM, West KP, Katz J. Blindness and visual impairment in Southern Malawi. Bull WHO 1986; 64:567- 72.

2. Juarez-Verdayes MA, Reyes-Lopez MA, Cancino-Diaz ME, et al. Isolation, vancomycin resistance and biofilm production of Staphylococcus epidermidis from patients with conjunctivitis, corneal ulcers, and endophthalmitis. Rev LatinoamMicrobiol 2006;48(3-4):238-46.
3. Callegan MC, Gilmore MS, Gregory MS, Gregory M, Ramadan RT, Wiskur BJ, Moyer AL, et al. Bacterial endophthalmitis: therapeutic challenges and host-pathogen interactions. ProgRetin Eye Res. 2007;26(2):189–203.
4. Vaziri K, Stephen G, Krishna S, Harry K, Flynn W. Endophthalmitis: state of the art. ClinOphthalmol. 2015;9:95–108.
5. Epling J. Bacterial conjunctivitis. ClinEvid. 2012;2:704.
6. Feaster F T, Nisbet M, Barber J C. Aeromonashydrophila corneal ulcer. Am. J. Ophthalmol. 1978; 85:114.
7. Macdonald R, Blatt M, Edwards W C. Shigella corneal ulcer. AM. J. Ophthalmol.1965; 60:136.
8. Duncan IB, Cheung EY, Haldane EV, Jackson FL, McNaughton RD, Morisset RA, Noble MA, Rennie RP, Ronald AR, Smith JA. Resistance to aminoglycoside antibiotics of gram-negative bacilli isolated in Canadian hospitals. Can Med Assoc J. 1981;124(9):1165–1167.
9. Maheshwari R, Maheshwari S, Shah T. Acute dacryocystitis causing orbital cellulitis and abscess. Orbit. 2009;28:196–199.
10. Moellering RC, Jr, Wennersten C, Kunz LJ, Poitras JW. Resistance to gentamicin, tobramycin and amikacin among clinical isolates of bacteria. Am J Med. 1977;62(6):873–881.
11. Ristuccia AM, Cunha BA. The aminoglycosides. Med Clin North Am. 1982;66(1):303–312.
12. Wang N, Yang Q, Tan Y, Lin L, Huang Q, Wu K.Bacterial Spectrum and Antibiotic Resistance Patterns of Ocular Infection: Differences between External and Intraocular Diseases. J Ophthalmol. 2015; 2015: 813979.
13. Gwon A. Topical ofloxacin compared with gentamicin in the treatment of external ocular infection. Ofloxacin Study Group. Br J Ophthalmol. 1992 Dec; 76(12): 714–718.
14. Bron AJ, Leber G, Rizk SN, Baig H, Elkington AR, Kirkby GR, Neoh C et al. Ofloxacin compared with chloramphenicol in the management of external ocular infection. Br J Ophthalmol. 1991 Nov; 75(11): 675–679.
15. Constantinou M, Daniell M, Snibson GR, Vu HT, Taylor HR. Ophthalmology. 2007 Sep; 114(9):1622-9.

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