

LETTER TO THE EDITOR

Antibiotic susceptibility pattern of bacteria isolated from corneal ulcer in a tertiary level eye hospital

Microbial keratitis is a major cause of corneal opacity and loss of vision worldwide.¹ Ulcerative microbial keratitis remains a leading cause of blindness worldwide.² The most common causative organisms are bacteria, although fungi and protists can also cause keratitis.¹ Bacterial keratitis is potentially more devastating ocular infection.³ The most common bacteria associated with corneal ulcer are *Pseudomonas aeruginosa*, *Staphylococcus aureus*, coagulase-negative Staphylococci and *Streptococcus pneumoniae*.⁴⁻⁵

Antibiotics play important roles in the treatment of bacterial infections. Topical antibiotics are used empirically before culture and sensitivity data become available.³ Antimicrobial resistance among bacteria causing various infections constitutes a serious problem throughout the world. Several reports indicate an increasing rate of bacterial resistance.^{6,7} Abuse and misuse of antibiotics have been known to contribute to the development of antibiotic resistance.⁷

This study was conducted at Ispahani Islamia Eye Institute and Hospital during the time period of January, 2012 to December, 2012. Out of 2020 keratitis samples, 272 culture positive bacterial isolates were tested for antibacterial sensitivity. Corneal scrapings were collected from clinically diagnosed corneal ulcer patients who were referred to the Microbiology laboratory for bacterial isolation, identification and culture & sensitivity tests from the OPD and Cornea and Anterior Segment Dept. of Ispahani Islamia Eye Institute and Hospital. Samples were directly inoculated onto bacterial culture media and incubated aerobically and anaerobically at 37°C for 48 hours and bacterial isolates were tested against Gentamicin, Chloramphenicol, Lomefloxacin, Levofloxacin, Ciprofloxacin, Tobramycin, Gatifloxacin and Moxifloxacin.

In this study, 13.5% of the cases were bacterial culture positive among which 79.8% was Gram positive and only 20.2% isolates were Gram negative (Table I). In different studies from India, Bahrain, Bangladesh and Australia, the bacterial culture positive cases of corneal ulcer were 32.5%, 39.0%, 53.5% and 65.0% respectively.^{2,3,8,9} In our

study (Table I), majority of the bacterial isolates from corneal ulcer included *Streptococcus pneumoniae* (40.4%), *Staphylococcus epidermidis* (19.1%), and *Pseudomonas* species (17.6%), and were highly sensitive to the commonly used broad spectrum antibiotics Gatifloxacin (>96%) and Moxifloxacin (>92%) and Chloramphenicol is becoming more resistant against the bacterial agents of keratitis (Table II). Another study in Bangladesh (2008) shows *Streptococcus pneumoniae* as the highest bacteria.¹⁰ In the studies of Basak and Baharathi, it was shown that *Streptococcus pneumoniae* was the most common bacterial isolate in South India.^{11,12} *Pseudomonas* sp. was the most common isolate in Bahrain, Australia and Ghana (1995) while *Staphylococcus aureus* was the most common isolate in West Bengal.^{8,9, 11} Agents of bacterial keratitis varies from region to region, country to country. In the study of Summiaya (2012), Gatifloxacin has highest efficacy against all isolates.¹³ Kowalski (2003) shown in their study that Gatifloxacin and Moxifloxacin are equally active against both Gram positive and Gram negative bacteria.¹⁴ In different studies it was shown that Chloramphenicol had a significant resistance against Gram negative bacteria which is in accordance with our study.³

Table I: Prevalence of microorganisms isolated from corneal scraping

Microorganism	Number	Percent (%)
Gram positive bacteria	217	79.8
<i>Streptococcus pneumoniae</i>	110	40.4
<i>Staphylococcus epidermidis</i>	52	19.1
<i>Staphylococcus aureus</i>	22	8.1
<i>Streptococcus viridans</i>	8	2.9
<i>Bacillus</i> sp.	22	8.1
<i>Diphtheroid</i> sp.	3	1.1
Gram negative bacteria	55	20.2
<i>Pseudomonas</i> sp.	48	17.6
<i>Proteus</i> sp.	4	1.5
<i>Haemophilus</i> sp.	2	0.7
<i>E.coli</i>	1	0.4
Total	272	100.0

Table II: Sensitivity pattern of bacterial isolates

Antibiotic	Gram positive bacteria		Gram negative bacteria	
	Sensitive (%)	Resistant (%)	Sensitive (%)	Resistant (%)
Gatifloxacin	99.4	0.6	96.3	3.7
Moxifloxacin	99.1	0.9	92.7	7.3
Lomefloxacin	70.4	29.6	88.0	12.0
Levofloxacin	88.6	11.4	94.3	5.7
Gentamycin	73.7	26.3	93.1	6.9
Ciprofloxacin	85.1	14.9	92.6	7.4
Tobramycin	69.1	30.9	91.7	8.3
Chloramphenicol	91.3	8.7	55.3	44.7

In our study, majority of bacterial corneal ulcers were due to Gram positive organisms rather than

Gram negative organisms. Most of the Gram positive organisms were susceptible to Gatifloxacin and Moxifloxacin, whereas Gram negative organisms were susceptible to Gatifloxacin, Levofloxacin, Gentamycin, Moxifloxacin, Ciprofloxacin and Tobramycin. Gatifloxacin had good coverage against both the type of bacterial isolates.

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