Optimizing Antibiotic Prophylaxis in Cataract Surgery: A Study of Conjunctival Isolates Sensitivity to Moxifloxacin, Ciprofloxacin and Tobramycin

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INTRODUCTION

- Post-operative endophthalmitis is a serious complication of intraocular surgery, which can lead to permanent vision loss. To prevent endophthalmitis, preoperative topical antibiotics are often used to control the bacterial count.
- The study aimed to examine the flora and sensitivity of commonly used antibiotics in preoperative cataract patients.
- The most common causes of endophthalmitis are Coagulase-negative staphylococcus, Staphylococcus aureus, and Streptococcus species [1] .
- Thoms et al. found that patients who did not receive topical antibiotics until the day after surgery had a greater risk of endophthalmitis [2]. A prospective study also showed that administering preoperative topical antibiotics reduced periocular flora [3]

- Therefore the count of these organisms need to be controlled preoperatively in order to prevent this dreaded complication. Use of appropriate antibiotics is thus important. There can be no ideal antibiotic as the flora of conjunctiva varies from region to region. Therefore, the antibiotic for that particular region should thus be sensitive to the predominant flora of that region.
- Prevalent use of antibiotics, development of resistance and alteration of the normal flora is another reason as to why this study is so important

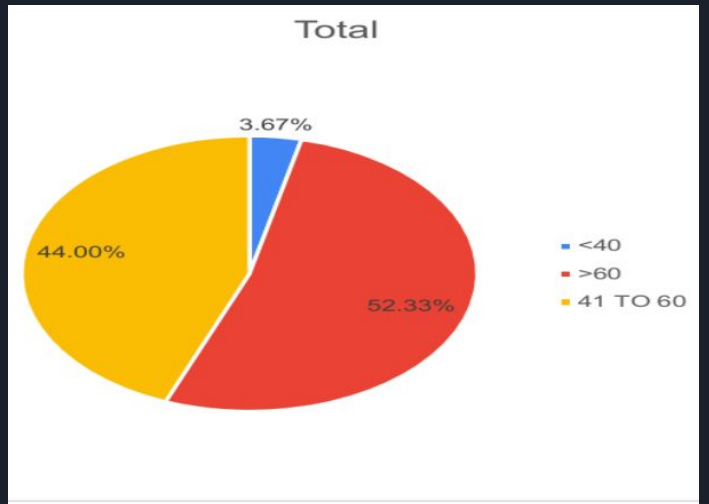
MATERIALS AND METHODS

STUDY DESIGN : Prospective Cross Sectional Observational study (non blinded and non randomized control study) done in patients scheduled for cataract surgery in a Tertiary Care Hospital. Statistical Analysis: Microsoft Excel. Tabulated and analyzed using SPSS (Statistical Package for Social Sciences) version 16.

STUDY PARTICIPANTS : The study consisted of patients who were admitted for cataract surgery. A sample size of 300 patients was taken.

INCLUSION CRITERIA : ● All preoperative cataract patients getting admitted for surgery. ● Age: 20-80 years. ● Patients willing to undertake the swab test.

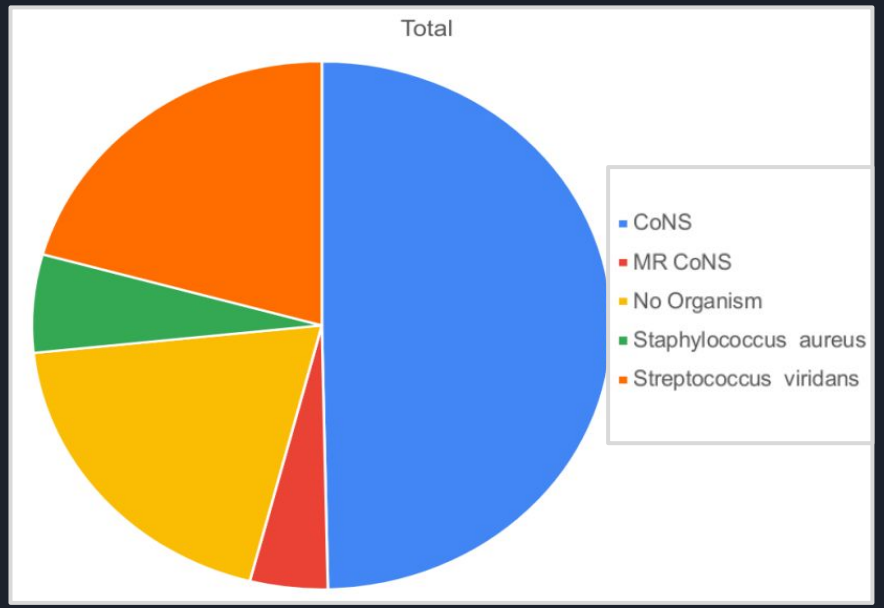
EXCLUSION CRITERIA : ● History of use of any antibiotics (topical and systemic). ● History of meibomitis ,blepharitis, dacryocystitis. ● History of conjunctivitis. ● Acute traumatic cataracts.



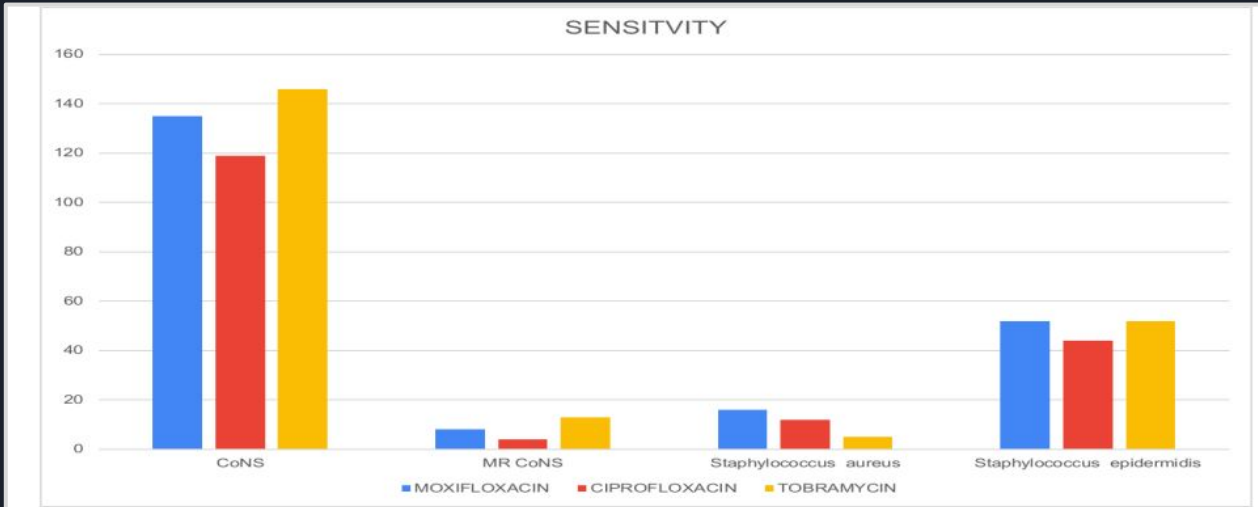
Graph 1 : Age Range

RESULTS

- The study took conjunctival swab samples from patients undergoing cataract surgery and found a culture positivity rate of 80.66%.
- The most commonly isolated organism was CoNS (61.6%) followed by Streptococcus viridans and Staphylococcus aureus.
- The study found no significant difference in positivity rates between patients with H/O diabetes or hypertension.



- Examining the sensitivity pattern, CoNS was the most sensitive to Tobramycin with sensitivity 97.32% (CI : 0.93 to 0.99) followed by Moxifloxacin (90.60%) (CI : 0.84 to 0.94) and Ciprofloxacin (79.19%) (CI : 0.79 to 0.84) in our study.
- Staphylococcus aureus showed fair sensitivity to Moxifloxacin (88.9%), moderate sensitivity to CIprofloxacin (66.67%), and poor sensitivity to Tobramycin (27.78%) .



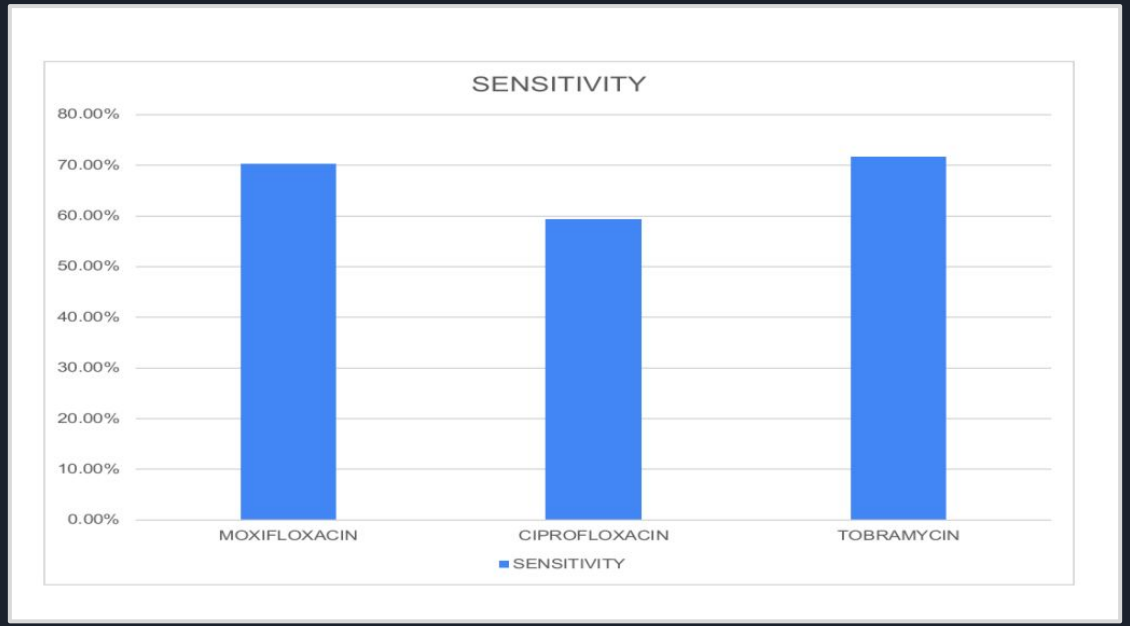
Graph 15 : Comparative sensitivity of organisms to the commonly used antibiotics

- Comparing average sensitivity of all organisms to 3 different antibiotics found that Tobramycin and Moxifloxacin were the most sensitive to all the organisms with sensitivity rate of 71.67% and 70.33% respectively.
- Both the antibiotics showed individually fairly good sensitivity to each organism isolated except that Tobramycin showed less sensitivity against S.aureus (27.78%)

COMPARISON OF SENSITIVITY N (%)				
DRUG	**CoNS (N/149)**	**MR CoNS (N/13)**	**Staphylococcus aureus (N/18)**	**Streptococcus viridans (N/62)**
MOXIFLOXACIN	135 (90.60%)	8 (61.54%)	16 (88.89%)	52 (83.87%)
CIPROFLOXACIN	119 (79.19%)	4 (30.77%)	12 (66.67%)	44 (70.97%)
TOBRAMYCIN	146 (97.32%)	13 (100%)	5 (27.78%)	52 (83.87%)

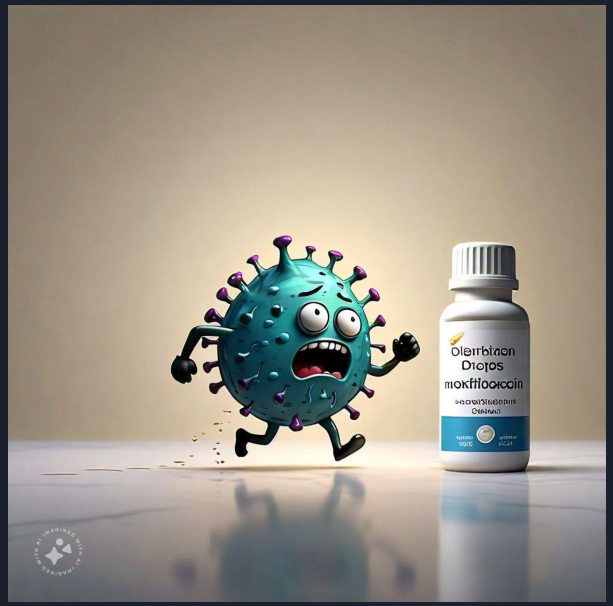
Table 13 : Comparison Of Sensitivity of Organisms to commonly used Antibiotics

- Least sensitivity was found with Ciprofloxacin against all organisms(59.33%).
- However, Ciprofloxacin showed fairly good sensitivity against CoNS, which was the most common organism isolated. (79.19%).
- Lower sensitivity of Ciprofloxacin in these isolates could be as a result of more empirical use of Ciprofloxacin in the last few years



DISCUSSION

- Antibiotics can show different susceptibility patterns of each isolated organism in different regions. This highlights the need for local epidemiological studies of sensitivity of commonly used antibiotics to normal bacterial flora of that region.
- Our study aimed to get some insight into the western region of India wherein no studies have been performed previously with very few studies having been undertaken in India.



TAKE HOME MESSAGE

- This study is needed due to recent increase in use of Moxifloxacin.
- Tobramycin is more commonly used in pediatric age groups This could be the reason for its higher sensitivity rates.
- Thus Moxifloxacin can be used as a first line drug and Tobramycin can be reserved for resistant cases.

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