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Prevalence of Extraocular Bacterial and Fungal Infections in Select Areas of Indore.

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Introduction

The eye is a unique organ that is able to shut out the majority of the inputs from its surroundings with amazing effectiveness. Tears, eyelids, and eyelashes are all natural defence mechanisms that the eyes use to protect themselves. Tears are known to include a wide variety of chemicals, including lysozymes and interferon, among others. Eye disorders are caused by pathogenic bacteria because the bacteria are virulent and the host is susceptible due to factors such as living conditions that are dirty, a low socioeconomic level, inadequate nutrition, genetic susceptibility, physiology, fever, or old age. Pathogenic bacteria can also cause eye disorders. Infections of the eye are rather frequent, and the effect they have on a patient's quality of life may range from being insignificant and self-limiting to being devastating if the infection progresses to the retina. Eye infections can cause blindness. When an infection of the eye develops, it most often affects the conjunctiva, lid, and cornea of the affected eye. Infections of the external eye may result in a range of unpleasant symptoms, such as conjunctivitis, keratitis, blepharitis, dacryocystitis, and an external hordeolum. Some of these symptoms may also be caused by an external haemorrhage.

One of the most typical kinds of eye infections is called conjunctivitis, and bacteria are often to blame for its development. In spite of the fact that the

lysosomes and antibodies present in tears as well as the blinking mechanism keep their population under control, bacterial infections nevertheless live on the surface of the eye (more specifically, the mucous membrane of the conjunctiva). The timely identification and treatment of microbial keratitis is vital because of the severe implications that may result from leaving the condition untreated. Fusarium, Alternaria, and various species of Aspergillus are the three fungus genera that are most often associated with mycotic keratitis. The vast majority of instances of fungal keratitis start with some type of injury to the eye. The bacterial aetiology, as well as patterns of susceptibility and resistance, may differ depending on geographical location as well as the population of the area. It is necessary to know the most up-to-date information regarding the aetiology and susceptibilities of bacteria that could cause eye infections in order to be able to make an educated choice on the first antibiotic treatment. This will allow you to treat the infection more effectively. Eye infections caused by bacteria are quite prevalent. In addition to assessing the in-vitro susceptibility of ocular bacterial isolates to routinely used antibiotics, the purpose of this research was to address issues about the prevalence, incidence, and aetiology of ocular bacterial and fungal infections.

Methodology

Participants in the research were required to have a clinical diagnosis of an external ocular infection, such as blepharitis, conjunctivitis, keratitis, or dacryocystitis. These victims received their medical attention at the Index Medical College and Hospital in the city of Indore, in the Indian state of Madhya Pradesh.

The ophthalmologist performed a thorough examination on each patient using the slit-lamp bio-microscope in accordance with the previously defined procedures.Everyone who took part in this investigation in one way or another The edge of the eyelid was scraped with a sterile blade mounted on a Bard-

Parker handle, and sterile cotton swabs were soaked in sterile broth before being used to collect blepharitis samples for culture and smear. This was done in accordance with conventional procedures for a comprehensive eye checkup. Specimens were taken from corneal ulcers using a similar procedure, which included scraping the lesions. In instances of conjunctivitis, a swab that had been moistened with broth was dragged over the lower conjunctival cul-de-sac in order to get conjunctival cultures. This was done in order to collect conjunctival fluid for use in subsequent research. In instances of dacryocystitis, purulent material was extracted from the everted punta by applying pressure to the region of the lacrimal sac.

All of the samples of eye tissue were cultured in brain heart infusion broth, sheep blood agar, chocolate agar, Mac Conkey's agar, and Sabouraud's dextrose agar. Thioglycollate medium was also used. The tissue from the cornea was removed using a scraper and then cultured as a "C"-shaped streak on blood agar. For direct microscopy, additional procedures including Gram stain, Kinyoun's acid-fast stain, and wet mounting with 10% potassium hydroxide (KOH) were carried out. The LPCB staining method and the slide culture technique were used in order to identify the fungi.

The results of microbial cultures were considered significant if they demonstrated the same organism growing on multiple solid-phase media, if the growth on one medium was confluent at the site of inoculation, if the growth on one medium was consistent with direct microscopy findings (that is, appropriate staining and morphology with Gram-stain), and if the same organism was shown to grow from multiple specimens. Standard biochemical procedures were successfully used in order to identify the isolated bacterial strains on a level that corresponded to their respective species.

The Kirby Bauer disc diffusion technique was used in accordance with the 2019 CLSI recommendations for the performance of antibiotic susceptibility testing. In this study, the susceptibility profiles of gramme-positive cocci were

investigated using antibiotic discs with varying concentrations of ampicillin (20 micrograms), gentamicin (20 micrograms), amikacin (10 micrograms), cefazolin (10 micrograms), cefuroxime (10 micrograms), ceftazidime (10 micrograms), cefotaxime (10 micrograms), piperacillin/tazobactam (10 micrograms), and cef In order to get some antimicrobial discs, we were suggested to make contact with the microbiology lab at Index Medical University.

Results

62% of patients with an external eye infection had a positive culture result, whereas 33% did not. This was based on a sample size of 100 patients. 41% of the total patient population was composed of females, while 56% was composed of males. This sickness had a far more severe impact on males than it did on women. Patients aged 50 and above had the highest prevalence of severe external ocular infections at 48 percent. Patients of both sexes were included in the study. Diabetes was identified in sixty out of the 100 total participants. Conjunctival infections, such as conjunctivitis, blepharitis, or dacryocystitis, accounted for 65% of culture-positive persons, while corneal infections, most often keratitis, accounted for 55% of culture-positive individuals. Ulcers on the cornea are almost always caused by infections that are brought on by contact with foreign substances, such as sand, thorns, rice husks, or fingernails. Unfortunately, diseases that are transmitted through the nails are extremely common. According to the findings of this research, the most common reason for corneal ulcers is an infection caused by rice husk. There were 62 different bacterial isolates discovered, and the majority of patients with culture-positive conjunctival infections were infected with a single species of bacteria. The remaining 8% of patients were infected with two different species of bacteria. Conjunctivitis was verified by culture in sixty different patients who were diagnosed with the eye infection. The great majority

of the bacterial isolates tested negative for the presence of the coagulase enzyme. Staphylococci made up 43% of the total, with Staphylococcus aureus constituting 25% of the total. Within the group of 78 culture-positive instances of keratitis, the rate of bacterial infection was found to be 36%, the rate of fungal infection was found to be 66.0%, and the rate of mixed infection was found to be 9.0%. The proportion of the total fungal population that was accounted for by Fusarium species was 48%, with Aspergillus flavus coming in a distant second with 26%., with bacteria accounting for 78% of those cases and fungus accounting for 22% of those cases.
Only 68 percent of the gramme-positive isolates were sensitive to ciprofloxacin, while all of the gramme-positive isolates were responsive to vancomycin. Gram-negative bacteria have demonstrated a great sensitivity to amikacin (91%), imipenam (9%), and fluoroquinolones (96%, including ciprofloxacin). This is true for the vast majority of gramme-negative bacteria.
Conclusion

This research was conducted at Index Medical College in Indore, and it aimed to identify the bacteria and fungi that are most often responsible for eye illnesses. In addition to this, it keeps a record of the drug susceptibility profile of the bacterial isolates, which will help the doctor control external ocular infections in a timely manner.

Reference

1) Ramesh S, Ramakrishnan R, Bharathi M, Amuthan M, Viswanathan S. Prevalence of bacterial pathogens causing ocular infection in south India. Indian J PatholMicrobiol. 2010;53(2):281–6.
2) Tesfaye T, Beyene G, Gelaw Y, Bekele S, Saravanan M. Bacterial Profile and Antimicrobial Susceptibility Pattern of External Ocular Infections in

Jimma University Specialized Hospital, Southwest Ethiopia. Am J Ophthalmol. 2013;1:13–20.

3) Sharma S. Antibiotics and Resistance in Ocular Infections. Indian J Med Microbiol. 2011;29:218–22.
4) Sthapit PR, Tuladhar NR, Marasini S, Khoju U, Thapa G. Bacterial Conjunctivitis and Use of Antibiotics in Dhulikhel Hospital - Kathmandu University Indore Kathmandu Univ Med J. 2011;9:69–72.
5) Whitcher JP, Srinivasan M, Upadhyay MP. Corneal blindness: a global perspective. Bull World Health Organ. 2001;79:214–21.
6) Marilyn H and Charles S. Conjunctivitis: Bacterial, Viral, Allergic and Other Types. All about vision.com. Access Media group LLC, March 2014.
7) Sinha R, Sharma N, Vajpayee RB. Corneal Blindness -- Present Status. Cataract & Refractive Surgery Today. 2005;59–61.
8) Lemp MA, Nichols KK. Blepharitis in the United States 2009: a survey-based perspective on prevalence and treatment. TOS. 2009;7:1–14.
9) Azari AA, Barney NP. Conjunctivitis A Systematic Review of Diagnosis and Treatment. JAMA. 2013;310:1721–9.
10) Chaudhry IA, Shamsi FA, Al-Rashed W. Bacteriology of chronic dacryocystitis in a tertiary eye care center. OphthalPlastReconstr Surg. 2005;21:207–10.
11) Mariotti SP, Pascolini D, Rose-Nussbaumer J. Trachoma: global magnitude of a preventable cause of blindness. Br J Ophthalmol. 2009;93:563–8.
12) Gopinathan U, Sharma S, Garg P, Rao G. Review of epidemiological features, microbiological diagnosis and treatment outcome of microbial keratitis: Experience of over a decade. Indian J Ophthalmol. 2009;57(4):273–9.