A Study of Demographic Pattern, Clinical Symptoms and Treatment Outcome in Patients of Keratitis.

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ABSTRACT

Background: Infections of the cornea are one of the common causes for blindness in developing countries. Corneal infections lead to corneal opacity which may result in blindness. Therefore, to decrease the incidence of blindness due keratitis: it is important to establish a broad spectrum strategy for the quick diagnosis and accurate treatment of the corneal infections. Methods: A retrospective study of records of 90 hospitalised patients with clinical diagnosis of infective keratitis at a tertiary care centre was done during the period of one and half year. Results: Ninety patients suffering with keratitis satisfying inclusion criteria were included in the present study. Among them men patients were fifty four (60%) whereas, female patients were thirty six (40%). Further, prevalence of keratitis was 2.25 %, 50 %, 32.1% and 6.9% for < 20 years (4), 21 to 40 years (45), 41 to 60 years (28), 61 to 80 years (13) age group respectively. Among 38 patients culture positive patients were staphylococcus aureus 27 (71%), Acinetobactor 2 (5%), Aspergillus sp 4 (10.5%), E coli 7 (18.4%), Pseudomonas 3 (7.8%) and dematiceous fungi 2 (5%). Conclusion: Findings of the present study suggest that incidence of corneal ulcer was more common in male population in agricultural occupation. An awareness program should be started addressing to the same population to decrease the prevalence of keratitis. Keywords: Bacterial keratitis, Occupation, Trauma.

INTRODUCTION

Infections of the cornea are one of the common causes for blindness in developing countries. Corneal infections lead to corneal opacity which may result in blindness. Suppurative infections of the cornea caused by bacterial keratitis are most common infections of cornea in India. However, epidemiological pattern and aetiology may differ significantly from place to place. Identification of causative bacteria and quick diagnosis are unavoidable for specific treatment of the keratitis. Several factors have been associated with ocular morbidity among them diagnosis of the keratitis and quick management of the infections are important factors. Therefore, to decrease the incident of blindness due keratitis: it is important to establish a broad spectrum strategy for the quick diagnosis and accurate treatment of the corneal infections. That is why, the present study was designed to assess the demographical pattern, microbial involvement and outcome of treatment in patients suffering with keratitis.

MATERIALS AND METHODS

A retrospective study of records of 90 hospitalised patients with clinical diagnosis of infective keratitis at a tertiary care centre was done during the period of one and half year. Loss of the corneal epithelium with underlying stromal infiltration and suppuration associated with signs of inflammation is known as corneal ulceration. Ulcers with characteristic features of viral infection and healing ulcers were excluded from this study. Similarly, any ulcer associated with autoimmune conditions or Mooren’s ulcer, interstitial keratitis, sterile neurotrophic ulcers, were excluded. Keratitis, whose microbiological examination was not done, was also excluded. A standardized form was filled out for each patient, filing socio-demographic characteristics, period of symptoms, predisposing factors, history of corneal trauma, traumatizing agents, related ocular conditions, other systemic diseases, therapy obtained earlier to presentation and visual insight at the time of presentation and of clinical examination. For all the patients Slit-lamp biomicroscopy examination was done. After staining with 2% fluorescein the size of the epithelial defect was measured and recorded in millimeters. In same way the size and depth of the stromal infiltrate was documented. Using standardized frontal and cross-sectional diagrams a sketch of each ulcer was drawn on the form. The height was measured in millimetres and presence or
absence of hypopyon was documented. Related ocular conditions like blepharitis, trichiasis, dacryocystitis, corneal degeneration, dry eyes, bullous keratopathy and pre-existing viral keratitis were recorded. The recording of use of contact lenses and of topical antibacterial agents, antifungal agents, corticosteroids and other systemic combinations were also done. Using aseptic technique and a flame sterilized Kimura spatula or a no. 15 Bard-Parker blade corneal scraping from each ulcer was done, after detailed ocular examination. After instillation of 4% lignocaine the procedure was performed under magnification of a slit-lamp or operating microscope. In a row of C-shaped streaks the material obtained from the leading edge and the base of each ulcer was initially inoculated directly onto solid media such as sheep’s blood agar, chocolate agar, and Sabouraud’s dextrose agar. Deep inoculation in fluid media such as brain heart infusion broth was also completed. For 10 % KOH wet mount, Gram staining, and Giemsa staining it was also spread onto labelled slides. In collection of material and its aseptic transfer to the proper culture media thorough care was taken. If growth of the same organism was demonstrated on more than one solid phase medium, and/or if there was confluent growth at the location of inoculation on one solid medium, and/or if growth of one medium was constant with direct microscopic findings (that is, appropriate staining and morphology with Gram-stain) and/or if the same organism was grown from repeated scraping, the microbial cultures were considered significant. Depending on the clinical type of keratitis treatment was started and the organisms identified. For bacterial keratitis Fortified cefazolin 5% and fortified tobramycin 1.4% eye drops were given. 5% natamycin eye drops and fluconazole eye drops for fungal and systemic antifungals were given wherever seems to be necessary. According to the clinical response antibiotics were gradually tapered.

RESULTS

Figure 1: Distribution of patients according to age groups.

Ninety patients suffering with keratitis satisfying inclusion criteria were included in the present study. Among them men patients were fifty four (60%) whereas, female patients were thirty six (40%). Further, prevalence of keratitis was 2.25 %, 50 %, 32.1% and 6.9% for < 20 years (4), 21 to 40 years (45), 41 to 60 years (28), 61 to 80 years (13) age group respectively. [Figure 2] shows that most of the keratitis patients were farmer 67 (72.2%) followed by house wife 8 (8.8%) and other occupations 12 (13.3%).

![Figure 2: Distribution of keratitis patients according to occupation.](image)

Table 1: Aetiological factors of infective keratitis.

<table>
<thead>
<tr>
<th>Aetiology</th>
<th>Number of patients</th>
<th>% of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetative matter</td>
<td>34</td>
<td>37.77%</td>
</tr>
<tr>
<td>Mud</td>
<td>4</td>
<td>4.44%</td>
</tr>
<tr>
<td>Finger</td>
<td>2</td>
<td>2.22%</td>
</tr>
<tr>
<td>Elbow</td>
<td>2</td>
<td>2.22%</td>
</tr>
<tr>
<td>Insect</td>
<td>4</td>
<td>4.44%</td>
</tr>
<tr>
<td>Bull’s tail</td>
<td>2</td>
<td>2.22%</td>
</tr>
<tr>
<td>Rope</td>
<td>2</td>
<td>2.22%</td>
</tr>
<tr>
<td>Cane sugar leaves</td>
<td>8</td>
<td>8.88%</td>
</tr>
<tr>
<td>Post surgery</td>
<td>4</td>
<td>4.44%</td>
</tr>
<tr>
<td>No agents</td>
<td>28</td>
<td>31.11%</td>
</tr>
</tbody>
</table>

Figure 3: Methods of detections and organisms.

[Figure 3] shows that 38 specimens were bacterial positive. Out of these positive culture samples pure bacterial growth 18 (20%), pure fungal 8 (8.8%) and mixed growth 12 (13.3%).
Majority of patients were using tropical antibiotics at the time of enrolment to the study. Thirty eight (38) patients were positive in culture with 24 patients were identified with bacterial positive whereas, 12 patients showed fungal growth. Apart from this 8 patients were found with both bacterial and fungal growth. Among 38 patients culture positive patients were staphylococcus aureus 27 (71%), Acinetobactor 2 (5%), Aspergillus sp 4 (10.5%), E coli 7 (18.4%), Pseudomonas 3 (7.8%) and dematiceous fungi 2 (5%).

Sensitivity pattern
Most of the bacteria isolated were sensitive to commonly utilized antibiotics. Most abundantly found bacteria Staphylococcus aureus was sensitive to amikacin, tobramycin, ceftriaxone, chloramphenicol, tetracyclines and ofloxacin. On the other hand, E coli, acinetobactor and pseudomonas were sensitive to aminoglycosides, fluoroquinolones, cefalosporins and tetracyclines.

Treatment and clinical outcome
Tropical antibiotics was used of twenty three (23) patients; whereas, antifungal was used for twelve (12) patients. Further, both antibiotics and antifungal were required for forty five (45) patients. Eighteen patients planned for keratoplasty were referred to higher centre.

DISCUSSION
Results of the current study has shown that keratitis was more common in male subjects compare to female subjects which is in agreement of previous studies of Liesegang TJ et.[7] and Gonzales CA et al.[8]

Maximum prevalence of keratitis was found in middle age group (21-40 years) population. These findings are consistent with the findings of previous study in which Upadhyay MP et al.[1] recorded similar prevalence of keratitis in middle age group. Most of the patients suffering with keratitis belongs agricultural background (75%) in the present study which is similar to the previous study of Srinivasan M et al.[9] and Upadhyay MP et al.[10] in which they recorded 78% and 72% prevalence correspondingly in people with agricultural occupation. This may be due to people with agricultural occupations are more prone to corneal injury due to their work of nature.[2] However, Hagan M et al recorded 16.1% prevalence of corneal ulcer in people with agricultural occupation. This difference of prevalence may be due to difference in pattern of occupation in Ghana and India.[10,4]

It has been suggested in various studies that corneal injury is foremost factor for keratitis with bacterial infections.[5,8] Findings of the current study have shown that trauma (37.7%) was the most common aetiological factor for keratitis in this study. This may be due to most of the patients were from agricultural background.[1]

Laboratory investigations of the present study have shown that 43.3% patients were positive culture. These findings are in agreement with the findings of the previous studies of Upadhyaya et al.[11] and Hagan et al[10] in which they observed 50% and 57.3% culture of ulcers consisted micro organism. On the other hand, Liesegang TJ et.[7] Khan et al,[12] and Dunlop et al.[4] recorded positive culture in 68.4%, 67.8% and 81.7% patients respectively. This comparatively low rate of bacterial isolation in the current study may be due to patients in the present study were using antibiotic drops before they enrolled for the study.

Pure bacterial growth was recorded in 20% whereas, pure fungal and mixed growth was found in 8.8% and 12% patients. These findings are in agreement in previous study of Upadhyay et al.[10] and Khanal et al.[13] Out of 38 positive culture patients most common bacteria isolated was staphylococcus aureus 27 (71%) while E coli 7 (18.4%) was second common bacteria. Which is very similar to the findings of the previous studies of Srinivasan et al and Upadhyay et al.[9,12]

Aspergillus species 4 (10.5%) was most commonly found in fungus isolates in the present study which are consistent with the previous study of Khanal et al as they recorded Aspergillus species accounting forly,[12] 38.4% fungal keratitis. Similarly Srinivasan M et al[9] (16.1%) and Upadhyaya et al.[10] (47%) recorded aspergillus species as most common fungal isolated in culture. In contrast to the present study Bharathi et al (52%) and Hagan M et al (42.8%) observed fusarium was the most common fungus isolated in culture.[10,13] This difference of isolated fungal in these studies may be due to different environment and climate.[15,16]

CONCLUSION
Loss of vision is a common concomitant of microbial Keratitis along with therapeutic challenges. Findings of the present study suggest that incidence of corneal ulcer was more common in male population in agricultural occupation. An awareness program should be started addressing to the same population to decrease the prevalence of keratitis. Most common bacterial and fungus isolates were Staphylococcus aureus and Aspergillus respectively. Findings of the current study showed early isolation of causative organ can provide information about exactly required medicine as use on an intensive antibiotic is an important step in the management of corneal ulcer which may decrease the possibility of vision loss in patients suffering with keratitis. However, more studies on large populations are required to decrease the ocular morbidity due to corneal ulcers.
REFERENCES


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