

A Study of Epidemiological and Clinical Profile of Fungal Keratitis in a Tertiary Eye Care Centre

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Abstract: When it comes to the eye, fungi are opportunistic because, unlike some virulent bacterial species, they rarely infect healthy, intact ocular tissues. Ocular fungal infections are increasingly being recognized as a significant cause of morbidity and blindness, particularly in developing countries and tropical regions. In this study Out of 100 subjects, 57% were males and 43% were females, This indicates a male predominance. Maximum subjects were from age group of >60 years (32%) followed by 31-40 years (22%) and 51-60 years (20%). The minimum subjects were from the age group of 10-20 years (2%). 68% of the subjects in the present study were farmers while 19% were housewives. Trauma was the primary predisposing factor for most patients with mycotic keratitis. Corneal trauma with an organic or herbal substance has been considered the predominant predisposing factor affecting 40–60% of patients with mycotic keratitis. In the present study; redness, watering, photophobia, discharge, pain and diminution of vision was reported among 80%, 82%, 62%, 39%, 48% and 16% of the subjects respectively. Diabetes mellitus was revealed in 7% of the subjects while 4% of the subjects were suffering from hypertension. Aspergillus was found more in diabetic cases while fusarium in hypertensive. Mild, moderate and severe corneal ulcer grading was revealed in 28%, 32% and 40% of the subjects respectively. Statistically significant association was found between presentation since trauma/symptoms according to severity of corneal ulcer as $p < 0.05$. The most common organism isolated was fusarium (48%) followed by aspergillus (40%). Aspergillus viz. Niger, fumigatus and flavus was found among 23%, 12% and 5% of the subjects respectively in this study. Approximately equal amount of improvement in visual acuity was found in Fusarium (p value 0.027%) and Aspergillus (p value 0.046) cases i.e. statistically significant. 15 subjects were lost to follow up. Healed with scarring, progressed with need for keratoplasty and adherent leucoma was reported among 65%, 18% and 2% of the subjects respectively. Out of 48 cases of Fusarium; 32 subjects healed Statistically significant association was found between presentation since trauma/symptoms according to severity of corneal ulcer as $p < 0.05$ with scarring while 9 progressed with need for keratoplasty. Out of 40 cases of Aspergillus; 25 subjects healed with scarring while 7 progressed with need for keratoplasty. This study explores the epidemiological and clinical characteristics of fungal keratitis among 100 patients at a tertiary eye care center in Central India. The study identifies a significant male predominance and highlights the age groups most affected. It examines the role of corneal trauma as a leading predisposing factor and provides a detailed analysis of the microbial organisms involved, primarily Fusarium and Aspergillus. The findings underscore the importance of early diagnosis and intervention in improving visual outcomes and reducing the need for surgical procedures such as keratoplasty.

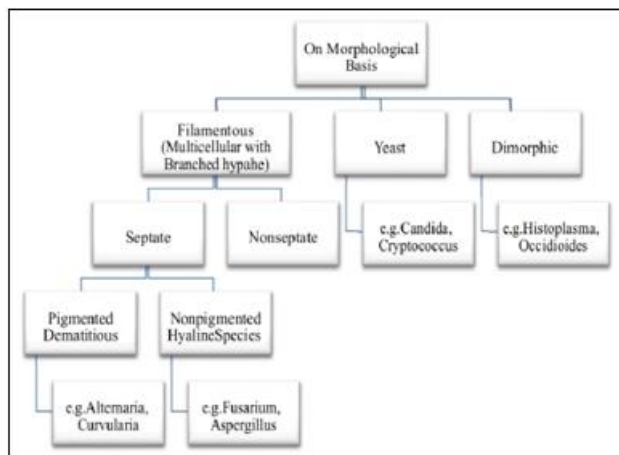
Keywords: fungal keratitis, corneal trauma, Fusarium, Aspergillus, visual outcomes

1. Introduction

Fungal corneal infections have become a significant global eye disease, particularly in developing countries, often leading to reduced vision or blindness. In India fungal infection comprising at least 60% of all culture positive cases and still growing.¹ Fungal keratitis is commonly caused by yeast and filamentous fungi. However, the primary global burden of disease is attributed to filamentous fungi, which predominantly affect patients in warm, humid tropical regions.² Filamentous fungal keratitis usually occurs in healthy young males between 20-50 years of age. They are prone to this disease than women, as they make up a greater proportion of agricultural and outdoor workers. Trauma is the key predisposing factor, occurring in 40-60% of patients.³⁻
⁵Fungi causing keratitis vary from region to region, and the

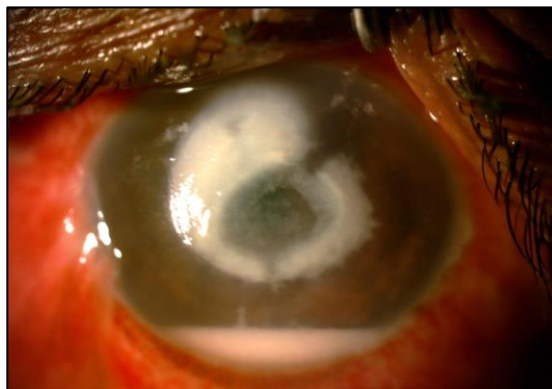
pattern of infection differs with respect to etiology and predisposing risk factors relating to geographical location and occupational exposure. Hence more recent epidemiological and clinical profile are needed to assess current estimates of fungal keratitis with emphasis on early treatment of fungal keratitis.⁶ Although studies have been conducted across the world specially in developing countries including India, there are no studies conducted from Maharashtra region and only single study from central part of India on epidemiological and clinical profile of fungal keratitis, to the best of our knowledge.⁽⁷⁻¹²⁾ In this thesis, we will report the results of epidemiological study conducted in 2022-2023 to document demographic pattern, risk factors, clinical, microbiological characteristics and visual outcome of fungal keratitis, in a tertiary eye care centre, central India.

2. Classification



Diagnosis of fungal keratitis:

- 1) **Clinical features:** Fungal keratitis has a somewhat sluggish progression. The clinical indicators⁽¹³⁻¹⁴⁾ are substantially more severe than the symptoms. Different morphological manifestations of fungal keratitis, including
 - Elevated slough that is firm or dry
 - Satellite infiltrates with an irregular
 - Feathery infiltrate edge
 - Wessley's immune ring
 - Endothelial fibrosis
 - Thick immobile hypopyon
- 2) **Laboratory diagnosis:**
 - A) Obtaining material for the diagnostic process
 - 1) Corneal scraping
 - 2) Corneal biopsy
 - 3) Anterior chamber tap
 - B) Material processing: There are various methods for material processing.
 - (1) Direct microscopy
 - (2) Culture
 - (3) Immunofluorescent staining
 - (4) PCR



3. Case Study

The present prospective observational study was conducted in a tertiary eye care centre among 100 patients clinically suspicious of fungal keratitis who were started on empirical therapy and those found smear or/and culture positive were enrolled for this study. The purpose of this study is to document the epidemiological patterns, risk factors, clinical and microbiological characteristics, and visual outcomes of fungal keratitis in patients at a tertiary eye care center in Central India.

Inclusion Criteria

Cases of clinically suspicious fungal keratitis with smear positive and /or culture positive reports

Exclusion Criteria

- All cases with viral keratitis, bacterial keratitis and mixed infection
- Endophthalmitis on presentation
- Non-infective traumatic corneal ulcer
- Ulcer due to burns
- Ulcers due to chemical injury
- Patient who are noncompliant or deny consent
- Neurotrophic keratitis
- Marginal keratitis
- Ulcer with autoimmune association

4. Conclusions

This study provides valuable epidemiological and clinical insights into fungal keratitis in Central India, highlighting the critical need for early intervention to improve visual outcomes. The study underscores the importance of addressing trauma as a major predisposing factor and suggests the need for better infrastructure at secondary care centers to facilitate timely referrals and culture testing. The findings can inform clinical practice and guide future research in similar settings.

This study is significant as it provides critical insights into the epidemiological and clinical profile of fungal keratitis in a region where such data is scarce. The findings can inform better clinical practices and preventive measures in similar settings.

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