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## Original Research Article

# The study of mycotic corneal ulcers in a tertiary care hospital in Mumbai

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### ABSTRACT

The study was carried out in a tertiary care hospital in Mumbai. A total of 65 fungal isolates from corneal scrapings taken from corneal ulcers were considered. Microscopy was done using 20% KOH. The culture was done using Sabourauds Dextrose Agar slants. The most common isolates were found to be *Aspergillus* and *Fusarium*. Also many other fungal isolates were found. The males were found to be more commonly affected by mycotic corneal ulcers than females. The mycotic corneal ulcer was found to be more common in counties like India.

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## 1. Introduction

Mycotic keratitis is an infection of the cornea by fungi which cause ulceration and inflammation. The disease is known since 1879 when Leber first reported a hypopyon ulcer caused by *aspergillus* species. Keratitis is the descriptive term used for corneal inflammation. Along with inflammation the loss of epithelium is called corneal ulcer.<sup>1</sup> Keratitis occurs mainly in developing countries due to various causes like lack of medical awareness, inaccessibility to medical treatment and occupations like farming, quereering and mining.<sup>1</sup>

The ocular surface is constantly exposed to a large number of infectious agents out of which only a few pathogens can cause corneal infection. Several mechanisms play a major role in the protection of the surface of the eye from infectious agents. Filamentous fungi are frequent cause of fungal corneal ulcers in humans.<sup>2</sup> Mycotic keratitis is world wide in distribution but is more common in tropical and subtropical regions. Trauma is the major predisposing factor followed by ocular and systemic defects, prior application of corticosteroids and prolonged use

of antibiotic eye drops.<sup>2</sup> The external ocular conditions on mycotic keratitis include pain, redness, dry eyes, bullous keratopathy, adnexal abnormalities like trichiasis and entropion, blepharitis lid edema, abnormalities and conjunctival congestion, corneal degeneration and defective vision.<sup>3-5</sup>

The consideration of fungal infection today and in the future rests on the historical admonition of earlier workers to keep in mind, not only the proper diagnosis be established, but perhaps of greater importance, to prevent fungal infections. Corneal blindness is a major challenge to the modern world which in majority due to corneal ulcers. So as far as ophthalmological lesions are concerned, keratomycosis is of importance because of the ravages it causes leaving the eye blind. The ocular mycosis should be one's guard when one recognizes corneal ulcers.<sup>6</sup>

## 2. Material and Methods

This prospective study of mycotic keratitis was carried out in Department of Microbiology, Grant Government Medical College and Sir JJ Group of Hospitals in a period of 2 years from January 2020 to December 2021. All patients who had corneal ulcers were included in this study.

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**Table 1:** Culture isolates and microscopic findings

Total samples	KOH positive	Culture positive & KOH positive	Culture positive & KOH negative
65	10	10	55

**Table 2:** Various fungal isolates

Organism isolated	Number
Aspergillus flavus	12
Aspergillus fumigatus	2
Aspergillus glaucus	5
Aspergillus terreus	2
Aspergillus species	3
Fusarium species	19
Fusarium solani	2
Fusarium oxysporon	1
Bipolaris species	2
Curvularia australiensis	1
Cladpsorium species	1
Scedosporium apiospermum	4
Filamentous fungus	5
Penicillium species	6
Total	65

**Table 3:** Age and sex incidence

Age in years	Male	Female	Total (%)
Below 20	2	0	2(3.07%)
21-30	11	1	12(18.4%)
31-40	6	3	9(13.8%)
41-50	7	1	8(12.3%)
51-60	12	3	15(23.7%)
Above 60	16	3	19 (29.2%)
Total	54(80.07%)	11(16.93%)	65 (100%)

Detailed examination of the eye was done and then the corneal scrapings were collected using a surgical blade. Corneal scrapings were collected after instillation of 0.5% proparacaine as eye drops. The corneal scrapings were collected from the base and the edge of the ulcer and were inoculated directly in the Sabouraud's dextrose agar. The material obtained by the subsequent scrapings were spread on glass slides for preparing 20% KOH mounts. The KOH mount was observed under 10X and 40X ocular lenses under the microscope. Strict aseptic precautions were taken during collection of the corneal scrapings.

The Sabouraud's dextrose agar was incubated at 22 degrees centigrade aerobically. It was observed thrice a week for 4 weeks. If there was growth obtained on a slant then the texture and colour was observed in the obverse and reverse of the Sabouraud's dextrose agar slant. A LPCB mount was made to identify the fungal growth. If there was no growth after 4 weeks then the culture was reported as negative.

### 3. Discussion

We included a total of 65 clinical isolates in our study from July 2019 to December 2021. Sabouraud's dextrose agar slant helped us to confirm the fungal etiology for mycotic keratitis. Growth of multiple fungi can create confusion. But in our study trained personnel for fungal growth on the Sabouraud's dextrose agar slant helped us to isolate the exact fungal isolates.

In the investigation of mycotic corneal ulcer its direct microscopic examination of the corneal scraping is the most important (Savitri et al, 2020). Examination of 20% potassium hydroxide has been useful in our study with 17.8% positivity (Table 1). Aspergillus and Fusarium species were most commonly isolated in our study (Table 2). The species of aspergillus most commonly found were Aspergillus flavus, Aspergillus fumigatus, Aspergillus terreus and Aspergillus glaucus. (Table 2). While the most common species of Fusarium found in our study were Fusarium solani and Fusarium oxysporon. (Table 2). 5 of the clinical isolates were unidentified filamentous fungi. The fungal isolates were most commonly found in the old age

groups above 60 followed by the age group of 50-60 years (Table 3).

Male patients were more frequent than female patients as in a study where males affected were 70.5% where as females affected were 29.5%.<sup>7</sup> In another study the percentage was 72.16% in males and 27.83% in females.<sup>1</sup> In our study the percentage of males affected was 83.07% while the females affected were 16.93%. While in our study the ratio was Male:Female ratio was 5.9:1.

#### 4. Conclusion

Mycotic keratitis is a major cause of blindness especially in tropical counties. Keeping in mind the rising rate of Mycotic keratitis it is important for individuals to follow good hygienic habits as a preventive measure.

#### 5. Conflict of Interest

The authors declare no relevant conflicts of interest.

#### 6. Source of Funding

None.

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