

Clinical Profile of the Patients of Fungal Corneal Ulcer: A Hospital Based Study

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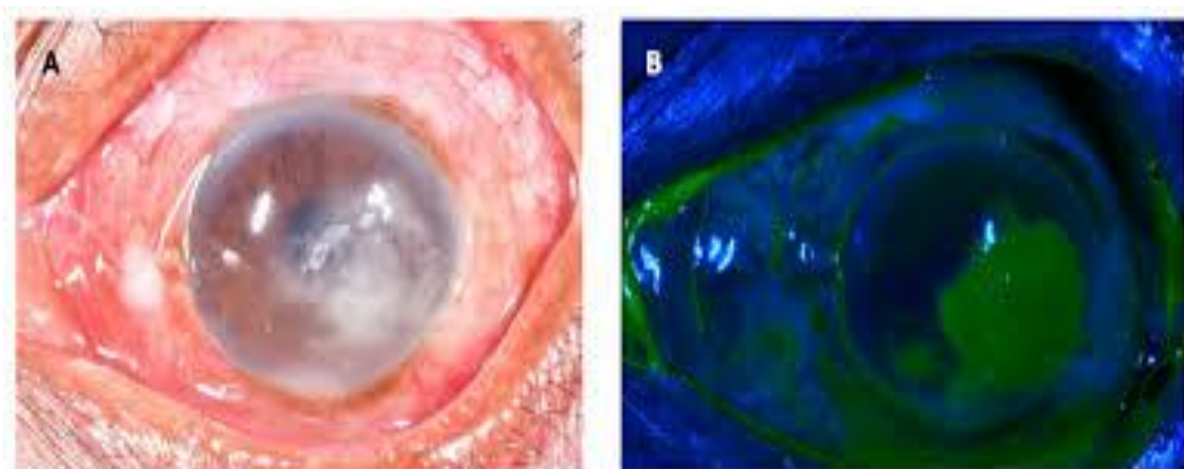
Abstract: Purpose: To investigate the predisposing factors and clinical presentations of mycotic keratitis Methods: This was a prospective study of cases with fungal keratitis, done between June 2022 and May 2023 who presented to OPD of Department of Ophthalmology, Maharani Laxmi Bai Medical College, Jhansi. Comprehensive history, Best corrected visual acuity, anterior segment assessment using Slit lamp biomicroscopy, flourescein staining, and IOP measurement using noncontact tonometry are all part of the clinical examination which were taken. Investigations were conducted, including Gram's staining, culture on Sabourauds dextrose agar, and corneal scrapings for KOH wet mount. The objective is to assess the risk factors, etiological agents, and prognosis in patients with fungal corneal ulcers. Results: Males made up the majority of cases (52%) in our study. The affected people were mostly residing in the rural areas. 17 patients were involved in agricultural activities. The people of 41 - 60 years of age were particularly prone to this disease. A history of ocular trauma was the most frequent risk factor for fungal keratitis, and 14 patients had a history of trauma including vegetative matter. *Aspergillus fumigatus* was the most prevalent causal agent among fungi, followed by several *Fusarium* species. Pain was the most prevalent presenting symptom which was seen in 89% of patients, followed by corneal infiltrate with satellite lesions (64%), watering (56%), total corneal ulcer with hypopyon (48% of patients), burning or foreign body sensation in the eyes Conclusion: The identification of the etiology and the predisposing factors of corneal ulcers in this region are important for the prevention and early treatment of the disease. Usually, patients with mixed bacterial and fungal keratitis have poor prognosis. Thus, when the infectious keratitis is running an atypical course or found unresponsive to the initial medical treatment, the possibility of a mixed infection by bacterial and fungal organisms should be considered.

Keywords: Fungal corneal ulcer, etiological agent

1. Introduction

A corneal ulcer, a flaw in the corneal epithelium that affects the underlying stroma, is a situation that could put your vision in danger^[1]. Depending on the area, mycotic keratitis, also known as fungal keratitis, makes up between 1 - 44% of all microbial keratitis cases^[2, 3]. The occurrence of fungal keratitis, which was originally described in 1879, has been rising in recent decades. About 40% to 50% of all cases of microbial keratitis are caused by it^[4, 5]. It is a dangerous

illness that, if left untreated, can cause endophthalmitis, corneal damage, and significant vision loss. Therefore, early detection and treatment are crucial to preventing long - term problems, such as blindness^[6, 7]. More than 100 different fungal species are capable of causing fungal corneal ulcer^[8]. The most common individual risk factors for FK include trauma, immunocompromised status, ocular surface illness, and contact lens use. These risk factors may make people more susceptible to various fungal infections^[9, 10].



The above **fig.1.** shows **A** - Fungal corneal ulcer Left Eye; **B** - when stained with fluorescent stain

2. Materials and Methods

This was a hospital based observational study that involved 30 patients presented to the outpatient department of Ophthalmology of our institute. Patients were diagnosed as having fungal corneal ulcer were included in the study after they gave written and informed consent during the period from June 2022 to May 2023. Study was performed under the guidelines given by Helsinki Declaration of 1975, as revised in 2000. The necessary permission from the Ethical and Research Committee was obtained before initiating the study. Each participant in the study provided demographic information as well as a thorough medical history. Every patient underwent a complete physical examination and systemic evaluation. Comprehensive history, BCVA, anterior segment assessment using Slit lamp biomicroscopy, fluorescein staining, and IOP measurement using noncontact tonometry are all part of the clinical examination. Microbiological studies such as cultivation on sabourauds dextrose agar and corneal scrapings for KOH wet mount were done. Syringing, RBS, BP, HIV and HBsAg serology tests were performed.

Inclusion Criteria

Patients of Fungal corneal ulcer in the age group of 18 to 60 yrs.

Exclusion Criteria

- Exposure keratitis
- Patients outside the age group of 18 to 60 years
- Patients with any corneal pathology.
- Patients with other conjunctival diseases
- Patients with recent intraocular surgery
- Patients with the history of trauma
- Patients with any other ocular pathology
- Mentally or physically unfit patients.

Laboratory Investigations

All inoculation media underwent aerobical incubations. If there was no growth after three weeks of incubation at 270 C° and daily inspection, the inoculated Sabouraud's dextrose agar medium were discarded. After inoculation, the blood agar, chocolate agar, thioglycolate broth, and brain - heart infusion broth were cultured at 370 C°, checked daily, and discarded if no growth was seen after 7 days.

When KOH wet mount preparations were positive for amoebic cysts, scrapings were inoculated in non - nutrient agar media overlaid with Escherichia coli. If, there was no growth in 3 weeks they were discarded. All laboratory methods were performed following standard protocols^[11, 12].

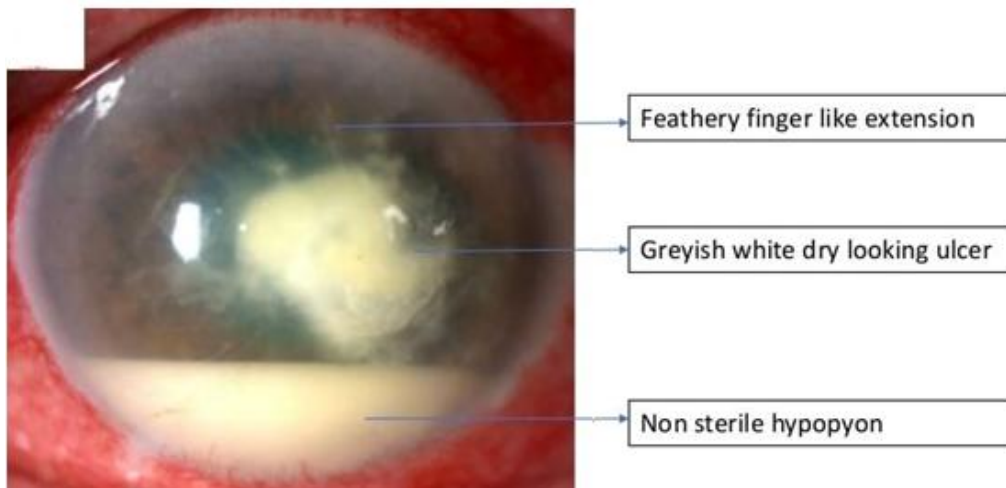


Figure 2: Showing Feathery finger like extension with nonsterile hypopyon

3. Results

Table 1: Showing the predominance of fungal corneal ulcer in each age group

S. No.	Age (in yrs)	No. of patients (%)
1	11 - 20	4
2	21 - 30	6
3	31 - 40	8
4	41 - 50	15
5	51 - 60	10
6	61 - 70	5
7	71 - 80	2
	Total =	50

Table 2: Showing gender prevalence

Sex	Number	%
Male	40	80
Female	10	20

Males were predominantly affected. The male – female ratio was 4: 1

Table 3: Showing predisposing factors for fungal corneal ulcer

Predisposing factors	No of ulcers	%	Contributing factors	%
Trauma	38	76	15	30
Foreign body	12	24	20	40

Table 4: Majority of patients presented with trauma to the eye as most common predisposing factor

Object	No. of patients	%
Vegetative matter	28	56
Animal tail	6	12
Self inflicted	1	2
Foreign body	15	30

Table 5: Showing clinical features and associated findings in fungal corneal ulcer

Clinical features	No. of patients	%
Corneal sloughing	47	94
Hypopyon	42	84
Satellite lesion	20	40
Perforation	38	76
Photophobia	44	88
Pain	50	100

Most common clinical feature was pain, which was followed by corneal sloughing then photophobia, hypopyon.

4. Treatment

Since fungus ulcers take longer to diagnose, treatment might be challenging. The Mycotic Ulcer Treatment Trial (MUTT) I study comparing voriconazole and natamycin found that natamycin significantly improved clinical outcomes when compared to voriconazole. In MUTT II, oral voriconazole was compared to an oral placebo, and the former showed promise in treating fusarium ulcers. The use of steroids is not recommended for fungal ulcers.

The initial therapy of choice for fungal ulcer, especially filamentous fungus, is typically topical natamycin 5% [13, 14] despite the fact that 31.3% of cases of first treatment failure have previously been documented [15]. Amphotericin B 0.15 - 0.3%, voriconazole 1%, econazole 1%, itraconazole 1%, and miconazole 1% are some other topical medications used to treat it. The therapy of choice for yeasts is amphotericin B. It is said that voriconazole 1% is a better option to natamycin since it penetrates the eye more effectively. Additionally, it may be injected intracamerally or intrastromally [16].

Patients with poor compliance and those who have severe keratitis may benefit from subconjunctival injections of antifungal medications like fluconazole and miconazole. Itraconazole, fluconazole, or intravenous amphotericin B can also be used as a systemic therapy.

In 2015, a Cochrane Database systematic review of the medicinal management of fungal keratitis was conducted. The research found that most trials were underpowered and of varied quality, but also suggested natamycin may be more effective than voriconazole in the treatment of fungal keratitis [17].

Surgical Treatment

When medication therapy is unsuccessful, patients may need surgical intervention, such as therapeutic lamellar and penetrating keratoplasty. However, therapeutic keratoplasty might have side effects, such as endophthalmitis, graft rejection, and recurrence of infection. [18]. Corneal collagen cross-linking is a newly accessible therapy option that may occasionally be helpful for corneal ulcers that are resistant to medical treatment or even in some early episodes of fungal infection [19, 20, 21].

Endophthalmitis situations that are serious may need intravitreal injections of antifungal medications or even a pars planovitrectomy, which can be done using endoscopy in

cases where there is significant corneal infiltration that makes it difficult to see the posterior segment [22, 23, 24]. However, enucleation might ultimately be the only option for an eye that is painful, blind, and inflamed beyond control.

5. Discussion

Typically, males are more likely to be impacted than females are [However, some research claim that females have a higher incidence of the disease. The age range of was where the sickness was more prevalent was 41–60 years, in contrast to Chowdhary and Singh's studies [25]. Where the preponderance was noted between 31–40 years of age. The fact that most patients at our hospital come from rural backgrounds may be the cause. The most common predisposing factor found in our study was trauma as seen in 38 patients (76%). The percentage of corneal trauma has been reported to be as high as 42% by Chowdhary and Singh [11].

There are several different types of fungi that can cause keratitis. Fusarium and Aspergillus are the most frequently ones. Aspergillus species are the most often implicated in studies of mycotickeratitis [25].

6. Conclusion

Fungal keratitis is a preventable, vision - threatening condition that nonetheless accounts for a sizable fraction of daily new cases and places a significant strain on healthcare resources. To reduce ocular morbidity and avoid complications, it is crucial to confirm the microbiological diagnosis because the clinical presentations of bacterial and fungal corneal ulcers frequently overlap. Early administration of antifungal along with antibiotic treatment helps in preventing dreadful complications. Features indicative of fungal keratitis include elevated edges, branching ulcers, feathery borders, rough texture, and satellite lesions. Corneal scrapings are used for the diagnosis. Sending samples for PCR and culturing is necessary.

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