

## Clinical evaluation of mycotic keratitis in a tertiary care hospital

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### Abstract

**Purpose:** 1. To study the clinical and microbiological aspects of fungal keratitis; 2. To study the predisposing and prognostic factors. 3. To study the clinical course management and outcomes of fungal keratitis; 4. To study the morphological features of corneal ulcer; To study the complications and final visual outcome.

**Material and Methods:** This study was carried out in Maharashtra in Marathwada region, over 31 patients, the patients who were showing signs and symptoms of fungal keratitis with special significance to predisposing and prognostic factors microbiological investigation management and follow up.

The data was assessed on the basis of simple percentages and ratios.

**Results:** Fungal corneal ulcer was predominantly found more in the age group of 51-60. Majority of fungal corneal ulcer were found in rural area. Majority of cases were more common in males as compared to female. Majority of fungal corneal ulcer patients had history of trauma as predisposing factor. Majority of trauma cases were because of vegetative material.

Majority of fungal corneal ulcer were related to farming activities. Inferior quadrant of cornea was most frequently involved in fungal corneal ulcer. Majority of fungal corneal ulcer were having rolled out margins. Majority of cases had thick and fibrinous hypopyon. Hypopyon was present in majority of fungal corneal ulcer patients. Distribution of fungal corneal ulcer studied. *Aspergillus niger*-18(58.06%); *Fusarium* 8(25.80%); *Cladosporium* 3(9.67%); *Penicillium* 2(6.45%).

**Keywords:** Fungal corneal ulcer, Fungal keratitis, Hypopyon.

### Introduction

The definition of suppurative keratitis is a defect in corneal epithelium with infiltration of underlying and surrounding trauma associated with signs of inflammation (with or without hypopyon) with super added infection.<sup>1</sup>

Corneal blindness accounts for 20 to 30% of all blindness in the developing countries of the world infective corneal disease is the leading cause of this problem in south Asia.<sup>2</sup>

Corneal blindness is a major public health problem in India and infections constitutes the most predominant cause.<sup>3</sup>

Surveys in Asia and Africa have confirmed this finding and a recent report on the causes of blindness world-wide constitutently lists corneal scarring second only to cataract as the major aetiology of blindness and visual disability in many of the developing nations in Asia Africa and the middle east 40 961).

According to WHO, among the major causes of vision loss and blindness in the world today are corneal diseases, second only to cataract in overall importance. In India there are approximately 6.8 million people who have corneal blindness with vision less than 20/200(6/60) or in at least one eye and of these about a million have bilateral corneal blindness.<sup>4</sup>

It is expected that by 2020 the number of corneally blind people in India will increase to 10.6 million. Globally it is estimated that annually ocular trauma and corneal ulceration result in 1.5 to 2 million new cases of corneal blindness. Ninety percent of these occur in developing countries and it has now got recognition as a silent epidemic a recent national survey by the government of India

estimated that corneal lesions are responsible for 9% of all blindness in our country.<sup>5</sup>

Fungal infections of the cornea are relatively infrequent in the developed world out constitute a larger proportion of keratitis cases in many parts of the developing world although these infections can cause devastating damage if allowed to progress unchecked advances in antimicrobial therapy and surgical techniques have improved their prognosis.<sup>6</sup>

Fungi are ubiquitous organisms that are recognised more frequently as ocular pathogens in agrarian tropical than in developed world in the warmer states and in the tropics corneal trauma which might be trivial frequently precedes infection concurrent contamination with plant material present an increased risk for fungal keratitis.<sup>7</sup>

Fungal keratitis is common in men above the age of 30yrs since they contribute significantly to the agricultural force of the country and are commonly injured with plant and other organic material.<sup>8</sup>

Ulcerative keratitis must be considered an urgent problem. Early recognition with prompt working up and rapid institution of appropriate therapy should significantly improve the visual prognosis. Still few eyes are lost due to perforation or panophthalmitis and infection with fungus severe fungal keratitis on presentation and inadequate response to current anti-fungal which are fungi static. This is a major cause for poor response of fungal keratitis.<sup>9</sup>

The present study is undertaken to evaluate the current concepts of the aetiology clinical characteristics, pathogenesis, microbiologic work up and management of suppurative keratitis. Aims of investigation were to improve facilities for laboratory diagnosis to determine predominant

causative microorganisms to identify most suitable treatment and encourage rapid referral of patients.

This prospective clinical study was carried out on 31 patients with fungal corneal ulcer from rural and urban areas of all age group.

**Inclusion Criteria:** All cases of fungal corneal ulcer which were diagnosed on the basis of microbiological study.

**Exclusion Criteria:** Corneal ulcer without microbiological evidence of fungal elements.  
Perforated corneal ulcer cases.

## Results

A total of 31 patients were examined during the period Sep 2010 to 2012 that were clinically and microbiologically diagnosed as having fungal corneal ulcer.

**Table 1: Age wise classification**

Age in years	Fungal corneal ulcer
0-10	0
11-20	1
21-30	5
31-40	8
41-50	6
51-60	8
61-70	2
70 above	6
Total	31

Maximum distribution was in the age group of 51-60 and 31-40 age group

**Table 2: Occupational distribution of fungal corneal ulcer cases**

Occupation	Fungal corneal ulcer
Household work	12
Farming related	14
Labourer	3
Other	2
Total	31

Farming was the occupation associated with maximum cases of fungal corneal ulcers

**Table 3: Predisposing factors for cases of corneal ulcer studied**

Factors associated	Fungal corneal ulcer
Trauma	26
Chronic dacryocystitis	0
Dry eye	0
Steroid usage	0
Lid disorder	0
Contact lens	0
None	5

Trauma was the most common factor associated with fungal corneal ulcer

**Table 4: Type of traumatic agent**

Agent	Fungal corneal ulcer
Vegetative matter	20
Soil /sand/ stone	3
Animal tail	2
Fingernail	0
Unknown	1

Vegetative trauma is the main risk factor for fungal corneal ulcer.

**Table 5: Visual acuity on presentation**

Visual acuity	No of cases
PL PR-6/60	25
6/60-6/36	5
6/12-6/36	1

Most cases were in the visual acuity group of PL PR-6/60.

## Discussion

Microbial keratitis is a common and potentially sight threatening ocular infection that may be caused by bacteria fungi virus or parasites.<sup>10</sup> The eyes are normally protected by various natural defence mechanisms from invasion by these microorganisms. However predisposing factors such as contact lens wear, corneal injury, ocular adnexal dysfunction corneal abnormalities and other exogenous factors may alter the resistance of the eye and permit fungus to invade the cornea species that normally are present in the conjunctival sac on the lids or periocular skin and in the adjacent nasal passages are the majority of bacteria cultured from infections of cornea.<sup>11</sup>

Microbial keratitis is an important cause of monocular blindness worldwide especially in developing world. All over the world bacterial keratitis is more common than fungal keratitis, but this does not hold true for India and other tropical countries where incidence of keratomycosis appears to be relatively higher.<sup>12</sup>

### Age

Age group with maximum fungal corneal ulcer found to be is 51-60.

Least incidence of cases were in the age group of 0-20.

Study carried out by Umashridhar et al in northern India on fungal corneal ulcer show mean age to be 54yr.

Kvraju et al showed peak incidence at 31-40 age group followed by 41-50.

M Shrinivasan et al showed peak age group of 41-60 yrs.

Balragunathan r showed peak incidence to be in age group of 31-40 yrs.

### Sex

In fungal keratitis 20 cases were male and 11 were female.

M Srinivasan et al at Madurai showed that the predominance of corneal ulceration in males was most pronounced in the middle years with an overall ratio of male to female patients of 1.6 to 1.

Uma Shridhar et al showed male to female ratio of 1.875.

Kvraju et al showed male to female ratio of 3.28.

Balragunathan R et al was 1.6.

### Area of Residence

Out of fungal cases 22 were rural accounting for 70.96% of cases various other studies show comparable results as it was found that incidence of fungal corneal ulcer was found to be more common in rural population M Srinivasan showed that majority of patients were from rural area.<sup>13</sup>

### Occupation

Farmers and occupation related to agriculture constituted 14 cases which was followed by 12 cases related to household work followed by 3 cases whose occupation was household work. M Srinivasan et al showed that majority of corneal ulcers were seen in rural population and those peoples who were related to agriculture and field work.

### Predisposing Factors

The most common predisposing factor for the development of corneal ulceration was corneal trauma representing 26 cases.

Present results are similar to M Srinivasan et al.

Bharti m j et al and other investigators who found the ocular trauma as the main predisposing factor for microbial keratitis.<sup>14</sup>

Study done by Ushagopinath et al also showed similar result.

Study carried out at Gujarat Vadodara by Govind L Ninama, Jivraj R Damor et al showed that vegetative trauma was the main predisposing factor for fungal corneal ulcer.<sup>15</sup>

### Type of Traumatic Agent

Most common traumatic agent was found to be vegetative trauma followed by soil/stone and animal tail.

### Location of the Principal Corneal Infiltrate

Inferior locations are the most frequently observed in fungal corneal ulcer cases involving 13 cases. The next most commonly involved site was central involving 8 cases according to duke elder infective keratitis usually involves central part of the cornea whereas non infective keratitis involves peripheral location.<sup>16</sup>

### Margins of Ulcer and Infiltrate

21 cases of fungal corneal ulcer were showing rolled out margin (67.74%).

A strong relationship between irregular margins and fungal keratitis has been shown by Dunlop A A et al in a case study of 142 cases in Bangladesh.

### Hypopyon

Presence of anterior chamber involvement with hypopyon was seen in 24 cases of fungal ulcer majority of which were thick and fibrinous in consistency.

### Fungal isolates

In our study the predominant fungus that was identified was aspergillusniger accounting for 58.06% of cases followed by fusarium 25.80% cladosporium 9.67%.

Penicillium 6.45% the results in our study is compatible with other studies that are carried out Srinivasan et al showed that 47.1% cases were because of fusarium followed by aspergillus 16.1% a study carried out by Umashridhar et al showed curvularia the most common fungus followed by fusarium and Aspergilluskrvaju et al showed that fusarium

was the most common fungus followed by Aspergillus Balraghunathan et al showed that aspergillus was the most common organism followed by fusarium.<sup>17</sup>

A study carried out at Bangladesh by Lailaakhtar M.A Salam et al showed that aspergillus was the most common organism followed by fusariummucor and rhizopus.

**Response to Treatment in Terms of Visual Acuity:** Out of 31 cases 12 cases improved and 12 deteriorated in terms of visual acuity.

**Complications:** Most common complication was perforation of 5 cases followed by 2 cases each of secondary glaucoma iridocyclitis and iris prolapsed followed by single case each of panophthalmitis and adherent leucoma.

**Conflict of Interest:** None.

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