

ORIGINAL ARTICLE

Prevalence of Oculomycosis in a Tertiary Care Centre

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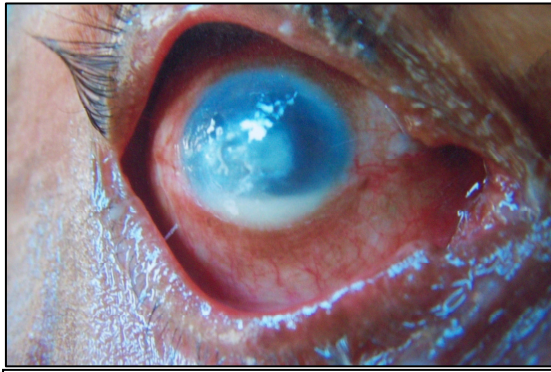
Abstract: *Objectives:* The present study was undertaken to investigate the prevalence of mycotic keratitis among clinically diagnosed cases of ulcerative keratitis attending ophthalmic OPD & admitted in ward of Shri Chhatrapati Shivaji Maharaj General Hospital, Solapur from Jan 2005 to Dec 2005. *Background:* Mycotic keratitis has emerged to be a major ophthalmic problem since its recognition in 1879, especially in subtropical & tropical climates. *Method:* The patients diagnosed clinically as minor corneal abrasion, healed corneal ulcer or corneal opacity with no signs of infection was not included in this study. The corneal scrapings were processed for bacteriological and mycological examination. The material was subjected to 10% KOH mount & cultured on Sabouraud dextrose agar with & without antibiotics. *Result:* Out of 74 samples, 13 (17.56%) revealed hyphae in direct KOH mount and 25 (33.78%) showed fungal culture positive. Among the fungal isolates, *Aspergillus* was more prevalent (18.91%) followed by *Fusarium spp.* (5.4%) and *Curvularia spp.* (2.7%). Among the rare fungi causing mycotic keratitis one isolate each of *Exserohilum rostratum*, *Colletotrichum gloeosporioides*, *Bipolaris spicifera* & *Rhodotorula rubra* were isolated in the present study. Out of 74 cases, agricultural workers 32 (43.24%) formed the major occupational group i.e.32 (43.24%) as they are more prone to trauma by vegetative matter. *Conclusion:* The bacteriological and mycological examination of keratitis is definitely contributory for specific management and to save the vision of the patients.

Key words: Oculomycosis, Agricultural workers, *Aspergillus*, Rare isolates

Introduction

Corneal ulceration is a major cause of blindness throughout the world due to its complications like scarring & perforation [1], out of which mycotic keratitis has emerged a major ophthalmic problem and contribute to 6-53% of all corneal infections worldwide [2]. The remarkable increase in the incidence of fungal infection has been attributed to the increasingly widespread and indiscriminate use of corticosteroids and broad-spectrum antibiotics [3]. In tropical regions, trauma, often of a trivial nature and frequently associated with vegetable material is well documented in the initiation of fungal infection [4].

Invasiveness of fungi in corneal tissue may be aided by formation of intrahyphal hyphae or by alterations in the fungal morphology, such as thickening of the fungal cell wall. Liberation of fungal proteinases or toxins and polymorphonuclear leucocytes, augment fungal invasion, resulting in extensive degradation of corneal tissue matrix [5]. Coagulation necrosis associated with loss of keratocytes and edematous changes of collagen fibres occur. Satellite lesions are formed late in



Photograph no.1: Fungal corneal ulcer

course of the disease process, hypopyon occurs with hyphae encased in dense neutrophilic exudates. Leukocytic infiltrate with feathery borders in the corneal stroma is characteristic of fungal keratitis [2] (Photograph no.1).

Though corneal ulcers are caused by bacteria, parasites & viruses, fungal etiology is significant in developing countries like India where agriculture remains the mainstay occupation. The most

common fungal isolate in keratitis is *Aspergillus spp.* [6-10]. *Fusarium* being more aggressive and less responsive to treatment than *Aspergillus* is reported to be the predominant cause of keratitis. *Candida albicans* & non-albicans have also been reported to cause keratitis. Dematiaceous fungi common in environment as plant saprophytes are of low virulence and are reported to be frequent cause of keratitis. Mere KOH examination is very important in deciding the line of therapy. Therefore this study was designed to investigate the prevalence of mycotic keratitis to establish definite diagnosis and treatment to improve prognosis.

Material and Methods

The present study was carried out in the Department of Microbiology, Dr. Vaishampayan Memorial Government Medical College; Solapur. The material for study was collected from 74 clinically diagnosed cases of ulcerative keratitis attending ophthalmology OPD & admitted in the ward of Shri Chhatrapati Shivaji Maharaj General Hospital, Solapur from Jan 2005 to Dec 2005.

Detailed clinical history of the patients in the form of age, sex, occupation, duration of symptoms, history of any trauma to the eye, associated disease and other predisposing factors if any were recorded. The patients were explained about the procedure and verbal consent for corneal scraping was taken. A thorough examination of the affected eye was done using slit lamp. The affected eye was cleaned with sterile normal saline and anaesthetized by using 2 to 3 drops of 4% lignocaine hydrochloride. With Bard Parker Blade no.15 the entire base of the ulcer as well as the edges were thoroughly scraped. The clinical material was processed for bacteriological & mycological examination. The corneal scrapings were subjected to microscopy and culture for isolation of both bacteria and fungus. 10% KOH wet mount was done to detect fungal elements. The material was inoculated on Sabouraud dextrose agar (Emmon's modification) with and without antibiotics and incubated at 30°C for 4 weeks. Identification was performed by using standard parameters. Gross examination of the isolate followed by microscopic examinations with Lactophenol cotton blue mount and slide culture was carried out for identification of filamentous fungi.

Results

Occupation	Corneal ulcer cases	Percentage (%)
Agricultural workers	32	43.25
Labourers	21	28.37
Housewives	13	17.56
Students	2	2.7
Other	6	8.1
Total	74	99.97

In the present study, maximum number of corneal ulcer cases were observed in the age group 51 to 70 yr (44.59%) followed by 31 to 50 yr (36.48%). Males predominated in the study accounting for 49(66.21%) cases in contrast to females accounting for 25(33.78%) cases. The male to female ratio was found to be 1.96:1. In this study, attendance of corneal ulcer cases were maximum (55.4%) during harvesting season i.e. from October to March. Table 1 shows that the agricultural workers formed the major occupational group 32(43.24%) with trauma being the most predominant predisposing factor. Out of 74 cases of corneal ulcers, culture showed growth of 30 (40.54%) bacterial and 25 (33.78%) fungal isolates; of which 8 cultures revealed combined type of growth i.e. bacterial and fungal . 13 clinical samples revealed hyphae in direct KOH mount.

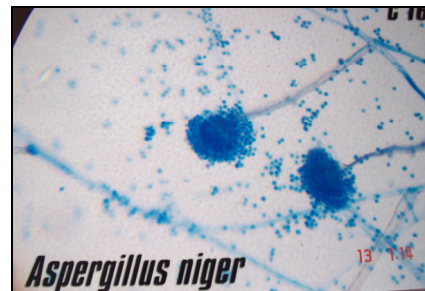
Name of the Fungus (n=74)	No. of Isolates	Percentage (%)
<i>Aspergillus niger</i>	5	6.75
<i>Aspergillus flavus</i>	3	4.05
<i>Aspergillus nidulans</i>	4	5.4
<i>Aspergillus terreus</i>	2	2.7
<i>Fusarium solani</i>	4	5.4
<i>Curvularia lunata</i>	1	1.35
<i>Curvularia brachyspora</i>	1	1.35
<i>Bipolaris spicifera</i>	1	1.35
<i>Colletotrichum gloeosporioides</i>	1	1.35
<i>Candida albicans</i>	1	1.35
<i>Exserohilum rostratum</i>	1	1.35
<i>Rhodotorula rubra</i>	1	1.35
Total	25	33.78

Table 2 shows that among the 25 fungal culture positive cases, *Aspergillus* was more prevalent (18.91%) which included *Aspergillus niger* (6.75%) (Photograph no.2 & 3), *Aspergillus nidulans* (5.4%), *Aspergillus flavus* (4.05) & *Aspergillus terreus* (2.7%). *Fusarium solani* was isolated in 5.4% (Photograph no.4 & 5) and *Curvularia* species in 2.7% of the cases. Among the rare fungi causing mycotic keratitis one isolate each of *Exserohilum*

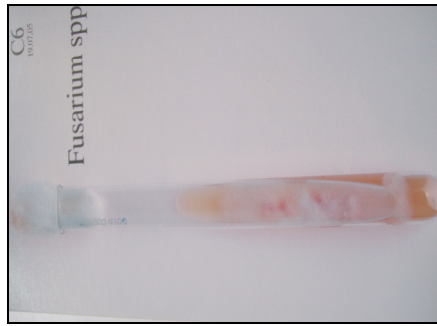
rostratum (Photograph no.6 & 7), *Colletotrichum gloeosporioides* & *Rhodotorula rubra* were isolated in the present study.



Photograph no.2: Sabouraud dextrose agar with growth of *Aspergillus niger*



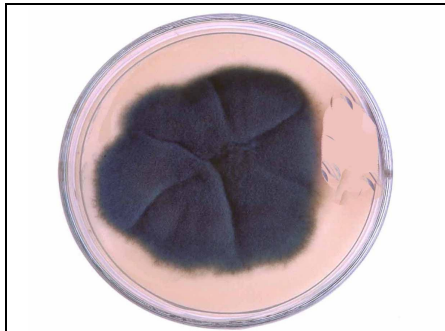
Photograph no.3: Lactophenol cotton blue stain showing *Aspergillus niger* (400x)



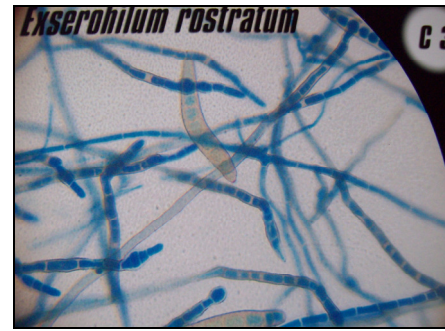
Photograph no.4: Sabouraud dextrose agar with growth of *Fusarium solani*



Photograph no.5: Lactophenol cotton blue stain showing *Fusarium solani* (400x)



Photograph no.6: Sabouraud dextrose agar with growth of *Exserohilum rostratum*



Photograph no.7: Lactophenol cotton blue stain showing *Exserohilum rostratum* (400x)

Discussion

In the present study maximum cases 33(44.59%) of corneal ulcer were observed between the age group 51 to 70 yrs i.e. elderly patients which correlated with the findings of Bharathi et al (2003) [7]. Maximum number of cases was recorded in months of October to March (55.40%) which corresponded with the harvesting season of this part of the country. Similar findings are reported by Kotigadde et al (1992) [10] & Bharathi et al (2003) [7].

India, due to its tropical climate & a large population involved in agricultural work is at risk of developing keratitis mainly of fungal etiology. In our study, agricultural workers 32 (43.24%) formed the major occupational group as they are more prone to trauma by vegetative matter. Among the 25 fungal culture positive cases, 10 were isolated from agricultural workers which included five *Aspergillus* spp., two *Fusarium solani*, one isolate each of *Colletotrichum gloeosporioides*, *Exserohilum rostratum* and *Rhodotorula rubra*. Similar findings are reported by Bharathi et al (2003) [7]. However, Kotigadde et al (1992) [10] reported housewives as the most affected occupational group. Of 25(33.78%) fungal isolates, *Aspergillus* spp. predominated as the incriminating fungus in 18.91% cases. This is in conformity with earlier reports. *Aspergillus* as the most common species was reported by Kotigadde et al (1992) [10], & Sharma et al (2000) [3].

In our study, *Fusarium solani* was the second most predominant fungal isolate i.e 5.4%. Most of the workers like Bharathi et al (2002) [7] & Srinivasan et al (1997) [6] reported *Fusarium* as the predominating fungus in their study.

Among the rare fungi causing mycotic keratitis, two *Curvularia* spp. & one isolate each of *Exserohilum rostratum*, *Colletotrichum gloeosporioides*, *Bipolaris spicifera* & *Rhodotorula rubra* were isolated in our present study. Similar rare fungal isolates were reported from earlier studies by Bharathi et al (2002) [7], Srinivas et al (1997) [6] & Kunimoto et al (2000) [11]. Nowadays, mycotic keratitis with newer fungal strains is increasingly recognized. The bacteriological & mycological examination of keratitis is definitely contributory for specific management & to save the vision of the patients.

Acknowledgement

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