

Fungal Profile of Keratomycosis

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Abstract

Corneal ulcers have been listed second only to cataract as the major cause of blindness. The present study was conducted to know fungal profile of mycotic keratitis.

Material and Methods : Corneal scrapings from 65 patients of suspected fungal aetiology were subjected to direct examination by 10% KOH and samples positive on direct examination were subjected to culture and growth was identified.

Results : Out of 65 samples, 42 were positive on D/E and 40 came out to be culture positive. Males were more affected (76.1%). Most of them in the age group of 41-60 years (71.4%). Trauma was the most common predisposing factor (80.9%) especially in agriculturists and farm labourers (76.1%). Aspergillous was the most common isolate (50%) followed by Fusarium (15%), Penicillium and Curvularia (10%), Paecilomyces and Mucor (5%), Exserohilum and Exophiala (2.5%) each.

Conclusion : Knowledge of geographical pattern of these fungi is important for appropriate treatment strategy.

Introduction

Corneal ulcers worldwide are a leading cause of ocular morbidity and blindness.¹ It is an important ophthalmological problem especially in outdoor workers in tropics. A report on the causes of blindness worldwide consistently lists corneal ulceration second only to cataract as the major aetiology of blindness.² A large number of filamentous fungi, yeasts and zygomycetes are associated with mycotic corneal ulcers. The frequency and spectrum of fungi involved varies from place to place as several factors like climate, age, sex, geographical and socioeconomic conditions play a significant role in modulating the incidence and prevalence of fungal corneal infections.³ Early diagnosis and treatment are important in preventing further complications like hypopyon

formation, endophthalmitis and loss of vision. In the recent years the new fungi are emerging as the cause of mycotic keratitis. The present study was conducted to study the fungal profile of mycotic keratitis and the various fungal species identified as aetiological agents.

Material and Methods

The present study was conducted in the Deptt of Microbiology and Ophthalmology, Government Medical College, Amritsar on 65 cases of corneal ulcer suspected clinically to be of fungal origin. History of trauma, age, sex and occupation of the patients was recorded. Scrapings were processed by direct examination in 10% KOH solution and 42 samples which were positive on direct examination were cultured on Sabourauds dextrose agar with antibiotics Chloramphenicol (50 mg/ml) and gentamycin (20 mg/ml) without cyclohexamide and incubated at 28° C. The appearance of growth

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was observed on alternate days. The growth was identified by standard procedures.⁴ Growth was studied for various characteristics and microscopic examination was done by lactophenol cotton blue preparation and examined under high power of microscope to study hyphae, conidiogenesis and arrangement of conidia in relation to hyphae. In case conidia were not seen, slide culture was put to reach to diagnosis. The tubes showing no growth were incubated up to eight days before declaring negative.

Results

Out of 65 cases of suspected fungal corneal ulcers, 42 (64.6 %) were positive for fungal elements in KOH preparation and these 42 when cultured showed growth in 40 samples (95.2%).

The age wise, sex wise, occupation and predisposing factors wise positivity is shown in Table 1.

Fungal isolates are shown in Table 2.

Discussion

In the present study, 42 (64.5%) were positive on D/E in KOH preparation where as it has been reported 22.2% by Saha *et al.*² The difference in findings may be due to the factor that they have included all types of corneal ulcers in their study. In contrast to that we have taken only cases which were clinically suspected to be of mycotic keratitis. Growth was obtained in 40 samples out of 42 which were positive on direct examination This is in consistence with the study of other authors.⁵⁻⁷ In two cases where growth was not obtained, it might be due to that fungi may be nonviable because of some topical application or the sample put for culture may be inadequate as corneal scrapings are very difficult to collect. In the present study incidence was highest in more than 40 years of age group (Table 1). It has been reported

to be 77% by other workers.⁸ Male to female ratio was observed as 3:1 in this study (Table 1). Similar findings were reported earlier.^{9,10} Higher incidence of mycotic keratitis in males may be due to work profile and outdoor activity. Higher incidence in agriculturists and field labourers (76.8%) because of more predispositions to trauma, which goes well with study of other authors who have reported it to be 82%.⁸ Injuries to eye is an important predisposing factor. We have obtained a definite history of antecedent corneal injury in about 80%-90%.^{11,12}

In the present study, the commonest isolates were Aspergillous species (50%). It goes well with findings of Reddy et al where

Table 1

	No. of cases	Percentage
Age in yrs.		
0-20	1	4.7
21-40	11	25.9
41-60 or > 60	30	70.4
Sex		
Males	32	76.8
Females	10	23.1
Occupation		
Agriculture field workers	32	76.8
Others	10	23.1
Predisposing factors		
Trauma	34	80.9
Unknown factors	8	19.4

Table 2 : Fungal isolates

	No. of cases	Percentage
Aspergillous	20	50
Fusarium	6	15
Penicillium	4	10
Curvularia	4	10
Paecilomyces	2	5
Mucor	2	5
Exserohilum	1	2.5
Exophiala	1	2.5

its isolation was reported to 50%.¹³ The isolation rate of *Fusarium* was 15% which is consistent with findings of other authors who showed it to be 14.7%¹⁴ but in some studies^{11,12} it has been shown to be 47.6%. This may be because of prevalence of these fungi in the environment as geographical distribution varies from place to place.

Penicillium and *Curvularia* were isolated in 10% (Table 2) where as other workers shown these to be 8.82%.¹⁵ The isolation rate of *Paecilomyces* was 5% in the present study where as it has been reported to be 2.94%, 3.2% by other workers respectively.^{16,17} The isolation rate of *Mucor* (Table 2) in the current study goes well with reported findings of other authors who reported it to be 3.7%.¹⁸ *Exserohilum* and *Exophiala* were reported from one case each in present study. These were earlier reported by Peerapur *et al* and Patel *et al*.^{19,20} To the best of our knowledge, much studies are not available on these or its isolation rate is very low.

It is thus concluded that mycotic ulcers are easily diagnosed by direct examination but diagnosis of specific aetiological agent is very important. Wide range of fungi were isolated. High index of clinical suspicion by Ophthalmologist and laboratory confirmation before prescribing corticosteroids or antibiotics is the key element of diagnosis of mycotic keratitis. So, precise identification of the causative agent in that area and appropriate treatment strategy can save the eye from blindness.

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