Microbiological Profile of Fungal Keratitis in North-West Rajasthan

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Abstract

Oculomycosis is a major cause of visual impairment, eye pain, redness, discharge, diminution of vision and photophobia are presenting features. We collected corneal scraping from 80 suspected cases of fungal keratitis and subjected them for KOH mount and fungus culture. On KOH mount, we observed fungal elements and yeast cells were present in 34 cases (42.5%), and 26 cases (32.5%) were found positive for fungal culture. Fusarium sp. (08), Aspergillus fumigatus (07), Alternaria sp. (03) and Rhizopus (02), Candida albicans (02) were predominant etiological agents. Trauma was a predisposing factor in 11 (13.75%) cases followed by steroid use 05 (6.25%) and contact lens use 02 (2.5%).

Keywords: Fungal, Keratitis, Oculomycosis, Microbial

Introduction

Microbial keratitis is the most common serious ocular infection and may be caused by a variety of bacteria, fungi, viruses, or parasites. Fungal keratitis constitutes common infection causing morbidity and preventable blindness. An incidence of 7–63% is documented from India. Early diagnosis may prevent visual disability.¹,² The etiological agents vary with the environmental and host factors and prior healthcare exposure.

There are very few studies on ocular mycoses in Rajasthan.³ Hence this study was planned to know the prevalence of ocular mycoses and its etiological agents.

The purpose of this study was to evaluate fungal pathogens in suspected cases of mycotic keratitis seen at a tertiary care center in North-West Rajasthan during a period of 7 months and compare these profiles with other series. The Knowledge of epidemiological profile of mycotic agent will help in presumptive treatment where culture is negative or facility does not exist.

Materials and Methods

The study of oculomycosis was conducted from January 2016 to July 2016 at a tertiary care institute. 80 corneal scrapings were collected from suspected oculomycosis patients under aseptic conditions and subjected for KOH mount and fungal culture in Microbiology Department of our Institute. The detailed H/O patients was taken regarding their sociodemographic factors, presenting complaints, risk factors, predisposing factors and prior use of medication, etc. The direct microscopy of 10% KOH wet mount was performed and scrapings were inoculated on four tubes of SDA (two tubes of SDA with cycloheximide and two tubes without cycloheximide). One tube from each set was kept at

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25°C and 37°C respectively. Tubes were examined twice a week for presence of growth and discarded at 4 weeks if no growth was seen.

The cultures were considered significant if the same isolate was obtained in more than one tube. The final identification was done after lactophenol cotton blue wet mount.

Result

A total of 80 patients presenting with eye ailments suspected of fungal origin were studied. This included 48 males and 32 females. Oculomycosis was established by culture in 26 cases giving the etiological prevalence of 32.5%. The age ranged between 5 years to 80 years and the maximum number of cases belonged to 21 to 50 years age group (29) followed by 50–80 years (20). The presenting complaints were eye discharge (79), eye pain (78), redness of eye (65) and dimness of vision (62).

Direct microscopy revealed fungal elements in 28 cases and budding yeast cells in 06 cases whereas 46 samples were found negative for fungal elements.

Fungi isolated were Fusarium sp. (08), A. fumigatus (06), Alteraria (03), Rhizopus (02), C. albicans (02), Epicoccum sp. (01), Phialophora (01), Aspergillus niger (01). Two cases were positive for mixed infections (one for Aspergillus and Alteraria species and the other case showed mixed infection with Alteraria and Drechslera species). Trauma (11) and steroid use (05) were found the predominant predisposing factors followed by use of contact lens (02), and one with diabetes mellitus.

| Name of Method | Outcome | No. | Fungus Culture Positive | Fungus Culture Negative |
|----------------|---------|-----|-------------------------|------------------------|
| KOH Mount      | Positive| 34  | 24                      | 10                     |
|                | Negative| 46  | 02                      | 44                     |
| Total Cases    |         | 80  | 26                      | 54                     |

| Fungal Isolates (species) | Total No. (26) |
|---------------------------|----------------|
| Fusarium                  | 08             |
| Aspergillus Fumigatus     | 06             |
| Alternaria                | 03             |
| Rhizopus                  | 02             |
| Candida albicans          | 02             |
| Epicoccum                 | 01             |
| Phialophora               | 01             |
| Aspergillus niger         | 01             |
| Alternaria + Drechslera   | 01             |
| Aspergillus + Alternaria  | 01             |

Discussion

Mycotic keratitis is a frequent cause of ocular morbidity in India. Its Incidence is reported to vary from 7% to 63% in various parts of India. There is a geographical variation in the incidence of fungal keratitis in India. The incidence is a little higher in South India (44%) as compared to North India (7.2–32%). A study from Goa, which is again in the south-western part of India, had reported a prevalence of 38.9%. This regional variation could be because the climate in the southern part of India is hot and humid for most part of the year. In the present study, the incidence was found to be 32.5% which is in accordance with earlier studies reported from India. In the present study, direct microscopy was found positive in 34 cases whereas fungus was grown in 26 cases. The reason for sterile culture in cases could be that the patients were already on antifungal agents before the samples were taken.

Fusarium and A. fumigatus species were found as predominant etiological agents causing keratitis in our study similar to the reports from other part of India. The dematiceous fungi are reported as causes of keratitis in many tropical and subtropical regions. In our study, the dematiceous fungi like Alternaria, Drechslera and Epicoccum were also found as other causative agents.

The fungal corneal ulcers may be reported at any age, and in our study the age of the patients varied from 5 years to 80 years; however, the most susceptible age group was 21–60 years. In addition, keratomycosis was found to be more common in men than in women. Men in this age group have greater exposure to fungal agents due to maximal outdoor activity.

Corneal trauma is the most frequent and major risk factor for fungal keratitis as has been evidenced by other studies also. In our study, 11 (13.6%) patients gave H/O trauma...
to eye. Steroid use for treatment of eye ailments was another predisposing factor (6.25%). Use of contact lens and diabetes mellitus were other contributory factors for mycotic keratitis.

**Conclusion**

Mycotic keratitis continues to be an important cause of ocular morbidity, predominant fungal pathogens being *Fusarium* Sp. and *A. fumigatus* respectively. Early diagnosis by meticulous examination of corneal scraping by direct microscopy and culture may diagnose the disease and timely instillation of antifungal drugs may limit ocular morbidity and disastrous sequelae among these patients.

**Conflict of Interest:** None

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