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CLINICO-ETIOLOGICAL PROFILE OF OCULO-MYCOSIS IN WESTERN ODISHA: A PROSPECTIVE STUDY

Microbiology

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ABSTRACT

Aim- A Two year prospective study of clinico-etiological profile of Ocular mycosis in western Odisha from March 2016 to February 2018.

Materials and Methods- Corneal scraping, vitreous, aqueous fluids and conjunctival swabs after the slit-lamp examination were collected under strict asepsis from suspected patients of oculomycosis.. Direct microscopy of 10% potassium hydroxide (KOH) wet mounts, gram staining, fungal and bacterial cultures were performed in the dept of microbiology

Result-. Fungal isolates were obtained in 21.42% patients with slight male preponderance and average age being 44 years. KOH wet mount showed fungi in 67.85%% samples. *Aspergillus* spp. (52.77%), *Fusarium* spp. (33.33%), *Candida spp* in 11.11% and melanised fungi (2.77%) were common etiological agents. Mucormycosis was reported in two diabetics. *Fusarium* spp. was more often associated with complications. Trauma was a predisposing factor in 75% cases and occurred mainly with vegetable matter. The majority responded to the conservative management with 5% natamycin and six patients underwent therapeutic keratoplasty.

Conclusion-Ophthalmic mycosis is a major cause of visual impairment. In contrast to other studies on fungal keratitis, *Aspergillus* spp. Was the most commonly isolated fungal pathogen which carries the worst prognosis. This study recommends early surgical intervention to improve the outcome.

KEYWORDS

INTRODUCTION

Ocular fungal infections, or ophthalmic mycoses, are being increasingly recognized as an important cause of morbidity and blindness; certain types of ophthalmic mycoses may even be life-threatening[1,2]. Keratitis (corneal infection) is the most frequent presentation [3], but the orbit, lids, lacrimal apparatus, conjunctiva, sclera, and intraocular structures may also be involved

Ophthalmic mycosis constitutes common infections causing morbidity and preventable blindness. The fungi frequently involve the cornea and intraocular chambers.[4] An incidence of 7–63% is documented from India.[5],[6] The etiological agents vary with the environmental and host factors and prior healthcare exposure. Antecedent traumas with vegetable matter, medication with antimicrobials or steroids, wearing of contact lenses or ocular surgeries are allied with an ocular mycosis.[5],[6],[7] Early diagnosis may prevent the visual disability

MATERIALS AND METHODS

A Two year prospective study of oculomycosis was conducted from March 2016 to February 2018 at a tertiary care teaching institute in Western Odisha. 157corneal scrapings, 7 vitreous fluids and 2 aqueous fluids along with surface swab from two suspected with mucormycosis were collected by the ophthalmologist from 168 patients. Samples were sent to the dept of microbiology at the earliest to be inoculated on blood and chocolate agar for bacterial culture, Sabouraud's dextrose agar for fungal culture followed by direct microscopy of 10% potassium hydroxide (KOH) wet mount and gram staining of smears. Cases with smear, culture-positive confirmed fungal infection were included in the study. Eyes with clinical diagnosis and no supportive laboratory results of fungal infection were excluded from the study. Positive laboratory results included one or more of the findings below:

1. Smear positive cases meaning the microscopic evidence of fungal element on one or more of Gram or calcofluor white (CFW).
2. Culture growth of fungal elements in one or more culture media.

Topical antifungal treatment was initiated after direct microscopy. Natamycin 5% eye drops hourly instillation with atropine drops thrice daily and oral itraconazole 200 mg or fluconazole 150 mg daily was started. Prophylactic antibiotic eye drops, 1 hourly were prescribed for bacterial co-pathogens. Excision of the cornea with therapeutic keratoplasty was done in advanced and refractory corneal infection. Intravitreal amphotericin B or voriconazole injections were given for fungal endophthalmitis where critically indicated and guided by the clinical judgment.

RESULTS

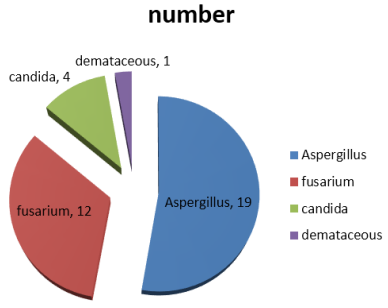
A total of 168 patients suspected of oculomycosis were studied. This included 96 (57.14%) men, 72 (42.85%) women and 80% were rural inhabitants. Oculomycosis was established by culture in 36 subjects except for two cases of mucormycosis which were diagnosed by the appearance of hyphae; giving the etiological prevalence of 21.42% with an equal slight male preponderance.. The age ranged between 18 and 75 years average being 44 years. Majority of cases were reported during harvesting season. The most common presenting complaints were eye discharge, pain and redness. The common predisposing factors were trauma in 71.05% subjects with vegetable matter, soil, dust or sand, k/c/o diabetes mellitus and previous ocular surgery.

RISK FACTORS	PERCENTAGE (%)
Trauma	71.05%
Diabetes mellitus	15.78%
Topical steroids	5.26%
Previous ocular surgery	2.63%

Fungi isolated were *Aspergillus* spp. in 19 cases which included nine *Aspergillus fumigatus* and eight *A. flavus and* two *A. niger; Fusarium spp.* in 12 cases, *Candida spp.* in four and dematiaceous fungi in one case.

KOH wet mount showed fungi in 67.85%% samples. *Aspergillus* spp. (52.77%), *Fusarium* spp. (33.33%), *Candida spp* in 11.11% and melanised fungi (2.77%) were common etiological agents. Mucormycosis was reported in two diabetics. *Fusarium* spp. was more often associated with complications

The mixed infection was observed in two cases which included *Staphylococcus aureus*.



FINAL ISOLATES	NUMBER OF CASES
A.fumigatus	9
A.flavus	8
A.niger	2
Fusarium spp.	12
Candida albicans	4
Mucor sp.	2
Demataceous fungi	1

Two patients with ocular mucormycosis were diagnosed with the typical appearance of non septate branched hyphae (>90 degree) and were managed conservatively along with surgical debridement.

Culture positive Patients were managed conservatively with topical 5% natamycin hourly, and atropine 3 hourly eye drops for 2 days followed by 2 hourly drops. Topical cefazoline, gentamycin, clindamycin or vancomycin was administered 6 hourly for bacterial co-pathogens. Three patients were given glue application with bandage contact lens for impending perforation. Six patients underwent therapeutic keratoplasty. The predisposing factors in these included diabetes mellitus, post-cataract surgery and trauma.

DISCUSSION

Fungi are an important cause of ocular infections leading to the visual impairment.[5],[6] Trauma with vegetable matter, sand and metallic objects is the key antecedent factor.[5],[6],[7],[8],[9] Increased incidence is witnessed during harvest season.[4],[6],[9]

Fungi constitute the normal flora of conjunctiva which invades cornea in immune-compensated conditions such as diabetes mellitus or use of topical steroid and antibiotics.[9],[10] Previous ocular surgeries predispose to keratomycosis, as seen in one patient in the present study.[11],[12] Wearing of contact lenses was not a contributory factor in our subjects unlike previous reports as the majority of our patients were ruralities not conversant with a contact lens usage.[9],[12],[13] Both men and women engaged in outdoor jobs showed higher incidence contrary to the earlier reports.[6],[8],[9],[10],[11],[13],[14],[15]

The presenting complaints are foreign body sensation, eye pain, redness, discharge, photophobia and dimness of vision.[16],[15] The slit-lamp examination reveals hypopyon as a characteristic feature.[16] We observed fixed hypopyon in 61.11% cases correlating with earlier reports of 45–66%.[9],[15],[17],[18]

The diverse clinical picture simulating the bacterial and parasitic infections is non-diagnostic thereby necessitating the laboratory confirmation. Fungi are visualized in KOH wet mounts in 62–90.9% cases.[5],[9],[13],[15],[19] We observed hyphae in 67.85% wet mounts in culture-proven cases.[5], 9, [20],[19],[21],[22] The mixed bacterial and fungal keratitis is reported in 1.85% cases from South India in support of 2.77% of our cases.[23]

Trauma is the most common risk factor directly related to the development of fungal keratitis. This is in favour with most other studies where trauma is cited as the major risk factor[25]. In developing countries trauma is reported in 90% of fungal ulcers. Of those, 60% are related to vegetative injuries (Gopinathan et al., 2002). In developed countries it is reported in 11–44% of cases, specifically related to agricultural trauma (Rosa et al., 1994; Xie et al., 2001).

Alternatively, in contrast to other reports (Rosa et al., 1994; Ou and Acharyya, 2007), none of the cases reported in our study had contact lens related fungal keratitis.

The spores of *Aspergillus* spp. can tolerate hot and dry weather conditions; inhabit soil, dust and decaying organic matter.[4]*Fusarium*, *Bipolaris* and *Curvularia* spp. are plant pathogens found mainly in cereal crops, plant debris, grasses and soil.[4]*Candida* spp.are implicated in prior ocular surface disease or surgeries and steroid or antibiotic therapies.[12],[14] These are the common isolates cultured from the infected eyes in the previous studies.[24] Thomas described *Fusarium solani* keratitis as more devastating, causing perforation or malignant glaucoma exhibiting the raised intraocular tension progressing rapidly to complete destruction of the eye.[20] The raised intraocular tension was notable in five cases out of twelve isolates which were *Fusarium* spp. The patients managed conservatively with continued medication for 6 weeks, recover well though a few require surgical intervention.

CONCLUSION

Oculomycosis is an infective condition involving healthy eyes, which leads to grave consequences. If strong clinical suspicion of fungal keratitis exists, KOH and Gram's staining are useful in diagnosis, in resource-poor situations. The presumptive treatment should be directed against *Fusarium* species.

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Conflicts of interest
There are no conflicts of interest.

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