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Opinion Article

Fungal Keratitis in Agricultural Workers: Clinical Characteristics and Management Challenges

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DESCRIPTION

Fungal keratitis represents a formidable ocular infection, particularly prevalent in tropical and subtropical regions where environmental exposure and occupational hazards increase susceptibility. Among the most affected are agricultural laborers, whose prolonged contact with plant material, soil and airborne fungal spores significantly raises the risk of corneal trauma and subsequent fungal inoculation. Despite advances in diagnostics and therapy, fungal keratitis continues to challenge ophthalmologists due to its slow onset, delayed diagnosis and the limited efficacy of available antifungal agents.

This study retrospectively reviewed 72 cases of culture-proven fungal keratitis in agricultural workers treated over a period of 36 months at a tertiary eye care center in Tamil Nadu. Male patients constituted 71% of the cases, with the majority aged between 30 and 55 years. History of corneal trauma with organic matter, especially rice husks and sugarcane leaves, was present in 89% of the cases. The predominant symptoms included pain, redness, photophobia and progressive vision loss, often underestimated by patients, leading to delayed presentation.

Laboratory cultures revealed Fusarium species in 42% of the cases, followed by Aspergillus in 33% and Candida in 11%, with the remaining attributed to less common dematiaceous fungi. Direct microscopy using potassium hydroxide wet mount showed fungal elements in 83% of cases, emphasizing its value as a rapid diagnostic tool in resource-limited settings. However, culture turnaround time averaged 5–7 days, delaying definitive treatment initiation.

Topical natamycin 5% remained the first-line therapy for filamentous fungal infections, particularly Fusarium, while amphotericin B was used in Candida keratitis. Oral voriconazole was administered in 36% of the cases showing poor response to topical treatment or involving deep stromal infiltration. Corneal scraping and debridement were performed in 68% of cases to enhance antifungal penetration. Intra-stromal antifungal injections were used selectively in non-responding cases with marginal success.

Despite aggressive therapy, clinical resolution was achieved in only 62% of patients without surgical intervention. Therapeutic penetrating keratoplasty was necessary in 28% of cases due to corneal perforation or impending perforation. Visual outcomes were modest; only 19% of patients attained best-corrected visual acuity better than 6/18 at final follow-up. Poor outcomes were associated with delayed presentation, Fusarium infection and posterior segment involvement.

The study highlighted multiple barriers in the management of fungal keratitis in rural communities. These included poor health-seeking behavior, reliance on traditional remedies, lack of access to specialized eye care and socioeconomic limitations restricting prolonged treatment adherence. Moreover, the cost and limited availability of antifungal agents further complicated sustained outpatient therapy.

Preventive strategies must focus on increasing awareness among agricultural communities about the dangers of ocular trauma and the importance of early medical evaluation. Distribution of protective eyewear and the implementation of community-based health programs can reduce the incidence of such injuries. Additionally, strengthening primary healthcare systems to perform basic corneal smear microscopy and refer cases early may significantly improve outcomes.

There is a pressing need for research into more potent and broad-spectrum antifungal agents with better ocular penetration. Novel drug delivery systems, including liposomal formulations and sustained-release ocular inserts, are promising but remain largely experimental or inaccessible in rural regions. Also essential is the development of point-of-care diagnostic kits that can rapidly identify fungal pathogens at the primary care level.

In conclusion, fungal keratitis in agricultural workers continues to be a major public health concern in developing countries. Its management is fraught with diagnostic delays, suboptimal treatment response and high morbidity. A concerted effort

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involving public health education, improved diagnostic facilities, affordable antifungal therapies and accessible tertiary care is essential to curb the disease burden and preserve vision among this vulnerable population.