Commentary: Dematiaceous fungal keratitis: Importance of ocular microbiology

Keratomycosis or mycotic keratitis is a significant cause of ocular morbidity affecting mostly the agrarian population in nearly 6-53% of cases of ulcerative keratitis, with the highest prevalence being reported in South India.[1,2] Although previously reported as rare agents of corneal ulcers, the melanized fungi are now emerging as an important entity second only to *Fusarium* and *Aspergillus* species.[3] Dematiaceous moulds also known as phaeohyphomycosis (phaeo is Greek for "dark") represent a very heterogeneous group of fungi, the distinguishing characteristic common to all these various species is the presence of melanin in cell walls, which is responsible for the dark color of hyphae, s and conidia, and is believed to be a major virulence factor enhancing opportunism. They have a cosmopolitan presence and the course of infection differs with the species; hence, for clinical management it is paramount to obtain an accurate species identification. Clinical impression is often suggestive but clinical features may vary considerably and no one clinical feature may be pathognomonic of dematiaceous fungi as it may also mimic other ocular surface diseases, including malignant melanoma of the conjunctiva and other infectious causes of keratitis. Empiric antifungal therapy is discouraged and confirmation of the diagnosis prior to institution of treatment is recommended and it is thus imperative that clinicians remain aware of this infectious entity. Studying the epidemiological pattern and outcome of dematiaceous fungal keratitis is thereby important as most of the earlier studies were published more than a decade ago. Understanding geographic and temporal trends in ocular infections helps in focusing not only on treatment but also on prevention and identification of root causes.

In this issue of the *Indian Journal of Ophthalmology*, the authors have analyzed a large cohort of 83 patients of microbiologically proven dematiaceous fungal keratitis thus highlighting the relative importance of pigmented fungi in the etiopathogensis of fungal keratitis from North India too.[4] Reviewing the literature on melanized fungal keratitis, some noteworthy facts could be appreciated. While the authors reported *Curvularia* sp. and *Alternaria* sp. as the predominant pathogenic genera causing dematiaceous fungal keratitis, which is comparable to earlier published reports,[1,3,5] they also found that, infections due to *Scedosporium* sp. were associated with the worst outcomes. The authors recorded presentation of pigmented, raised, plaque-like infiltrate in only 18% of the patients and resolution of stromal infiltrate with corneal scarring was seen in 80% patients in their study. Additionally, two new genera, *Ulocladium* and *Epicoccum* species which have not been previously reported, were identified in their series. Thus, the laboratory represents the fundamental basis for a definitive diagnosis and this importance may be more relevant in the Indian context, where fungi and bacteria cause corneal ulcers almost in equal proportions it is often difficult to diagnose them in real life without the help of microbiology. Though identification of melanized fungi and melanin-like elements are possible by conventional diagnostic procedures like KOH mount and gram-stained smear, growth in culture is confirmatory. In culture, melanin imparts colonial pigmentation ranging from buff to pale brown in some species, but predominantly olivaceous to brown to black. While a few of these black molds may display a mucoid or yeast-like phase, at least initially, most appear filamentous in culture.[5,6] However, in general, dematiaceous fungi exhibit slow growth and poor morphology and therefore the clinical presentation and diagnosis is often delayed.

At our institution, we have developed a special interest in unidentified dematiceous fungi or fungi that do not produce spores or conidial structures necessary for an accurate identification of species and thus get reported as unidentified. With the introduction of newer and rapid molecular diagnostic methods, nearly all species can confidently be recognized by the rDNA ITS barcoding marker. Accurate identification of fungi at the species level would be of great importance as

the pathogenic potential may vary between different species and genera. As we put the pieces of the puzzle together, we believe that interest will be rekindled among clinicians and microbiologists to work together to join forces and take up an integrative approach in raising awareness and tackling this problem on a routine basis. To conclude, such studies combined with antimicrobial susceptibility will help better define the epidemiology and medical management besides identifying uncommon pathogens.

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