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LETTER TO EDITOR

Roles of Adherence and Matrix Metalloproteinases in Growth Patterns of Fungal Pathogens in Cornea

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Dear Editor,

We read with great interest the paper "Roles of Adherence and Matrix Metalloproteinases in Growth Patterns of Fungal Pathogens in Cornea" published in *Current Eye Research*.[1]

We congratulate the authors for this very informative article on the pathogenesis of fungal keratitis. We complement the authors on using a novel technique in developing a rabbit model of fungal keratitis without the use of corticosteroid by inoculating the stromal surface after debriding the epithelium and suturing a donor graft onto it. All the previous reports including that by O'Day *et al.*[2] and our own study[3] document that it is difficult to sustain fungal infection of cornea in experimental rabbits in the absence of corticosteroid treatment. In our own experiment, we found that steroid-untreated corneas developed a small infiltrate on day 2 that progressed to 3 mm by day 5 and appeared almost healed by day 10. The excised corneal buttons on day 10 from this group were culture negative on microbiology evaluation and did not show fungal filaments on histopathology examination. However, Dong *et al.*[1] in their study have shown deep stromal invasion of fungal filaments without the use of corticosteroid, an observation contradictory to previous reports. Therefore, it would be worthwhile if the authors describe or postulate a mechanism or principle by which they were able to achieve invasive fungal keratitis successfully without the use of steroids.

We found it very interesting to look at the natural history of fungal keratitis in this animal model. The clinical manifestations peaked at day 3 after inoculation and lightened by day 8. In addition, the levels of MMP-9 also declined to the same as on day 1 (shown in Fig. 6B of the article). These findings are almost identical to those observed in "steroid untreated group" of Gopinathan's series.[3] Therefore, it is desirable to describe each "outcome measure" at different time intervals after inoculation. We could not find this information related to histopathology evaluation (both inflammation and fungal mass) in the publication.

Further, it was interesting to note that all corneas in *Fusarium* group showed less severe clinical picture, and fungal filaments were arranged parallel to

corneal stromal lamellae on histopathology evaluation. However, in a study on histopathologic and microbiologic evaluation of 167 corneal buttons from fungal keratitis cases published from our center by Vemuganti *et al*., we did not find any correlation between species and pattern of fungal distribution in corneal stroma.[4] Further, review of the literature on clinical picture also suggests that compared with *Aspergillus*, *Fusarium* produces an equal or more serious keratitis.[5] It is therefore crucial to address these discrepancies in this animal model.

Because keratitis is a dynamic process, it will be useful to mention in all figures the day on which the observation is made. In the absence of this information, it is very difficult to draw any conclusions.

In conclusion, although this animal model of fungal keratitis without corticosteroid appears exciting, many issues need to be reviewed and clarified so as to make it reproducible.

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