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## Role of Voriconazole in the Management of Fungal Corneal Ulcers

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**Abstract: Purpose:** To evaluate the role of Voriconazole in the management of fungal corneal ulcers. **Design:** prospective interventional comparative study. **Patients & Methods:** Eighty eyes of 80 patients who suffered from uncomplicated fungal corneal ulcer were enrolled in this study, they were subjected to the following: Full history taking, visual acuity (VA), slit lamp biomicroscopy, ultrasonography (to assess the posterior segment), corneal scraping for potassium hydroxide (KOH) test and culture to confirm fungal infection and identify species (if possible). Patients were divided into four groups: Group 1: 20 eyes received one intrastromal injection with Voriconazole (50 microgram/0.1 ml) at the junction of clear cornea and infiltrates, using a 30-gauge needle in five sites to form a barrage around the ulcer. Group 2: 20 eyes received topical antifungal (Voriconazole eye drops (E.D) 1%). Group 3: 20 eyes received intracameral Voriconazole 100 microgram Voriconazole in 0.1 mL. Group 4: 20 received topical, intrastromal and intracameral Voriconazole (combined therapy). The four groups received topical Moxifloxacin hydrochloride 0.5% (E.D) four times a day and 1% Isopto-atropine E.D twice a day. Treatment has been started as soon as the (KOH) test is positive and followed for at least 2 months. **Results:** The four groups were matched regarding the mean baseline BCVA. In four groups, the BCVA after treatment with Voriconazole improved significantly than the pre-treatment one. When the mean post-treatment BCVA was compared between four groups, there was a significantly higher BCVA in group 4 than in groups 1,2 and 3 ( $p=0.038$ ). In group 1, complete healing was obtained in 17 eyes (85%) versus 6 eyes only in group 2 (30%), 18 eyes in group 3 (90%) and 19 eyes in group 4 (95%) which also was a statistically significant difference between four groups ( $P=0.041$ ). The mean resolution time varied significantly between four groups, it was  $20.4\pm 3$  days for group (1),  $26.4\pm 3.50$  days for group (2),  $18\pm 2$  days for group (3),  $14\pm 2$  days for group (4) ( $P=0.0213$ ). Complication rate was higher for group (2) of topical treatment (25%) than for group (1) (10%), no complications were recorded in groups (3) and (4). **Conclusion:** Voriconazole is effective in the management of fungal corneal ulcer either topical antifungal (Voriconazole eye drops 1%), intrastromal injection with Voriconazole (50 microgram/0.1 ml) or intracameral Voriconazole (100 microgram Voriconazole in 0.1 mL). but intracameral and Intraströmål are more effective, they have a high success rate.

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**Key words:** Voriconazole, fungal corneal ulcer.

### 1. Introduction

Fungal keratitis accounts for nearly 50% of all cases of infectious keratitis in developing countries and has a poor prognosis compared with bacterial keratitis.<sup>1, 2</sup> Currently available topical antifungal drugs have limitations such as poor penetration into the eye, limited spectrum of activity and surface toxicity.<sup>3-5</sup> Surgical intervention in the form of therapeutic Keratoplasty is required more often in cases of fungal keratitis, compared with bacterial keratitis, indicating a poor response to treatment with antifungal agents.<sup>2,6</sup>

A less invasive surgical modality of use of intrastromal Amphotericin B and Voriconazole for cases of deep-seated fungal keratitis, non-responsive to topical and oral antifungal agents have been described in anecdotal reports.<sup>7-9</sup>

Voriconazole, a more recent azole antifungal drug, is available commercially for systemic administration in the form of oral and intravenous

formulations. It has an excellent broad spectrum antifungal activity and is active against species that are known to be resistant to the other antifungal agents commonly used in fungal keratitis.<sup>10</sup>

Voriconazole is increasingly being used topically as eye drops. Topical Voriconazole has demonstrated good penetration into the different parts of the eye,<sup>11,12</sup> with sufficient concentrations achieved to cover a wide range of keratitis-causative fungi.<sup>10</sup> Few recent papers showed that Voriconazole is more effective when injected intrastromally. In experimental studies, Voriconazole has been shown to be less toxic to the retina than amphotericin B and to exhibit exponential decay with a half-life of 2.5 hours in rabbit vitreous and a very low aqueous concentration, below the therapeutic levels of fungal species. Therefore, intracameral Voriconazole injection is indicated to achieve a higher aqueous concentration and is considered to be an alternative in the treatment of fungal endophthalmitis spreading as