

Clinical Profile and Evaluation of Topical Voriconazole for Management of Fungal Corneal Ulcer in North Western Rajasthan

Kalpna Jain*, Jyoti Garhwal and Taruna Swami

*Department of Ophthalmology, S.P. Medical College, Bikaner, Rajasthan, India.

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Corneal ulcer is one of important ophthalmic condition causing significant morbidity, especially in the developing countries. Corneal ulcer is second commonest cause of treatable blindness after cataract among people in Asia, Africa and Middle East. Worldwide reported incidence of mycotic keratitis is 17%-36%, while in India is 44%-47%. Filamentous fungi are responsible for a larger proportion of fungal corneal infections in tropical climates, particularly following trauma with vegetative matter. Voriconazole is a triazole having potency against wide spectrum of fungi. It is used by different routes and formulations.

This was a single centre prospective tertiary care hospital study conducted in north western Rajasthan (India). Permission from institutional review board had taken. It included 50 corneal ulcer patients of any age group and either sex who had culture and/or smear positive fungal corneal ulcer. Patients not willing to give informed consent, impending or frank corneal perforation, concomitant endophthalmitis and immunocompromised were excluded from study. Topical antifungal was started as soon as the fungus was identified which included voriconazole 1% w/v eye drop every 2 h, drops of 1% atropine thrice a day and tablet fluconazole 150 mg OD. Voriconazole drops are aseptically constituted by diluting 30 mg voriconazole powder commercially available in the market. The infection was considered resolved when there was complete healing of epithelial defect with resolution of corneal abscess and scar formation. Statistical analysis was done using Chi square test.

The age range of study population was 11-75 years with 60% patients were male. In our study keratomycosis was seen mostly in farmers (46%) followed by students (16%) and laborers (14%) and 60% of these patients were male. In majority of cases corneal injury was an important predisposing factor. Most common cause of injury was vegetative matter (40%) followed by sand trauma (16%) and insect trauma (12%). In majority of keratomycosis, *Aspergillus* (46%) species was observed followed by *Fusarium* species (30%). Other less common species were *Candida* (12%), *Alternaria* (6%), *Curvularia*, *Epicoccum* and *Rhizopus* (2%). The size of the ulcer varied from 2.0 to 8.3

mm and the size of infiltrate varied from 0.5 to 3.5 mm area around the ulcer. Out of 45 patients, 50% patients were categorized under moderate group, followed by severe (42%) and mild (8%). In majority of cases (80%) the ulcer depth was 1/4th to 2/3rd of cornea, i.e., moderate followed by mild (14%) and severe (6%). Hypopyon was present in 25 patients. 45 cases of fungal ulcers improved clinically within 7 days of treatment. 5 cases did not show any improvement up to 15 days. These 5 cases were treated further with intrastromal voriconazole. Most of the cases of keratomycosis involve stroma, so macular opacity formed in 78% cases. Nebular opacity was seen in 20% cases and leucomatous opacity in 2%. At the time of presentation, 29 patients presented with visual acuity of perception of light to <1/60. After treatment with topical voriconazole out of these 29 patients visual acuity improved up to 1/60-6/60 in 25 patients, 6/12-6/6 in 2 patients and remains same in 2 patients. The improvement was clinically and statistically significant ($p < 0.0001$). The average duration of healing was 5.5 weeks. Voriconazole is potent against a wide spectrum of fungi, namely *Candida albicans*, *Candida parapsilosis*, *Candida tropicalis*, *Aspergillus fumigatus*, *Aspergillus flavus*, *Fusarium solani* and other less common pathogens from the *Paecilomyces*, *Histoplasma*, *Scedosporium*, *Curvularia* and *Acremonium* species, etc.

The most common age group affected was 6th decade (24.4%) in our study. It is mainly due to poor general health condition and less medical attention. The higher incidence of keratitis in males can be attributed to more outdoor activity of males in field activities related to agriculture and farming. Contact lens wear also reported as one of the major associated conditions in industrial countries in many studies

Corresponding author: Kalpna Jain, MS, Professor, Department of Ophthalmology, S.P. Medical College, Bikaner, India, E-mail: kalpnadaga@gmail.com

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but there was no case of contact lens wear in our study. The possible reason is that the habit of wearing contact lens is not common in rural background, particularly in the poor farmers. The majority of patients were categorized under the moderate group, both according to size (55.6%) and depth of ulcer (77.7%). This was mainly because most of the patients presented within the second and third week (55.6%). Forty five patients who responded to topical voriconazole got symptomatic relief and by the end of the first week, a reduction in the ulcer size and infiltration was noted. The voriconazole eye drops helped in early and complete resolution of ulcer with no adverse effects reported in our study. After completion of treatment with topical voriconazole, visual acuity improved which was clinically and statistically significant ($p < 0.0001$).

Our study showed voriconazole therapy has promising role in early and complete resolution of fungal ulcers with no adverse effects.