IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 24, Issue 1 Ser. 1 (January. 2025), PP 11-15
www.iosrjournals.org

A Clinical Study Of Fungal Keratitis And Its Management In A Tribal Government Hospital

Dr. Sai Nikhita.M[1], Dr.Ram Charan Teja [2]
(Ophthalmology, Dr N.T.R.University And Health Sciences, India)
(Ophthalmology, Dr N.T.R.University And Health Sciences, India)

Abstract:
Background*: Fungal keratitis is a serious concern for ocular morbidity in developing country like India. It can lead to a variety of ocular complications, a major proportion of which is preventable with early intervention. As the treatment requires usage of topical medications for prolonged periods, the cost factors, socioeconomic and educational status of patients play a major role in the management and recovery.*
Materials and Methods*: A study of 30 cases of fungal corneal ulcers was conducted in our hospital. A detailed history was taken and complete ocular and systemic examination was done. Microbiological work up of corneal scrapings was done. After that treated with topical and systemic antifungals, cycloplegics and anti-glaucoma medications. Followed for a period of 8 weeks.*
Results*: All patients were KOH positive for fungal organisms. All of them had history of trauma and injury with vegetative matter. . 90 % of cases have raised blood sugars Topical Natamycin was used in all patients. After treatment 26 cases were healed with corneal opacity. 2 cases were referred immediately due to perforated corneal ulcer. 2 cases were referred after 2 weeks due to resistance to treatment*
Conclusion: *The accurate diagnosis, early management, timely referral is most important in preventing ocular morbidity due to fungal keratitis*
Key Word*: Fungal Keratitis; Corneal ulcer; Natamycin; Topical Antifungals*

Date of Submission: 23-12-2024 Date of Acceptance: 03-01-2025

I. Introduction

Fungal keratitis accounts for approximately 50% of all microbial keratitis[1].Fungi thrive in hot and humid environment and rich in vegetable matter and organic decay[2]. The typical feature of fungal corneal ulcer is slow onset and gradual progression, where signs are much more than the symptoms. The most common feature of fungal keratitis is small satellite lesions around the ulcer. Immobile hypopyon is often present[5].

Most commonly caused by *Aspergillus* spp., *Fusarium* spp and others include *Candida* spp., *Rhizopus*. Studies from northern part of the country demonstrated *Aspergillus* as the most common fungus in mycotic corneal ulcers, whereas *Fusarium* was reported to be the most common fungus in southern part of the country [6].

Fungal pathogens enter the cornea after an epithelial breach, following trauma or foreign body in the form of vegetative material or soil particles. After invasion incite a host inflammatory response[7]. The inflammatory response in fungal infections is less aggressive and slow compared to bacteria. The fungus secretes proteolytic enzymes and fungal antigens and toxins which facilitates their deeper stromal penetration and breach the descements membrane and thereby reach the anterior chamber. [7]

Diagnosis and treatment of fungal corneal ulcers can be quite challenging because of the delay in seeking medical attention due to reduced symptoms and the limited antifungal agents available for ocular use and poor antifungal drug penetration [3 8 9] . The current study aims to study the diagnosis and management of fungal keratitis in a tribal primary health care setup and to bring awareness for immediate checkups and prevention strategies.

II. Material And Methods

This prospective and observational study was carried out on patients of Department of Ophthalmology at a tribal government hospital from December 2023 to November 2024. A total 30 adult subjects (both male and females) of aged ≥ 18, years were for in this study.

Inclusion criteria:
1. All Fungal corneal ulcer patients based on the history and the slit-lamp examination

2. Either sex
3. Aged ≥ 18 years,

Exclusion criteria:
1. All ulcers other than fungal ulcers
2. Perforated corneal ulcers
3. Preexisting corneal disorders
4. Ulcers associated with autoimmune conditions

Procedure methodology

A total of 30 cases with a clinical diagnosis of fungal corneal ulcer based on the history and the slit-lamp examination were included after obtaining consent. Features considered in making the diagnosis of fungal corneal ulcer were history of injury with a vegetative matter or foreign body and clinical signs and symptoms of fungal ulcer, i.e., firm, dry elevated central ulcer with satellite lesion with immobile hypopyon and immune ring [Figure 1].

The sample was obtained by scraping from the margins of corneal ulcer. First, the cornea was anesthetized using 0.5% proparacaine solution and then scraping was done using a sterile No. 15 Bard-Parker blade.

Gram's stain and 10% KOH mount done for the obtained samples. After obtaining the reports of positive 10% KOH preparation, topical antifungal drugs like natamycin 5% eye suspension were used hourly for the first 48 hours and then decreased to 2nd hourly and continued at least 3rd hourly for at least 2 weeks after healing of the ulcer.

Along with the above drugs, topical cycloplegics like Homatropine 2% eye drops were used. Antiglaucoma medications like topical timolol maleate 0.5% eye drops used when ever necessary. Topical antibacterial drops like moxifloxacin 0.5% or Tobramycin 0.3% were used to prevent further bacterial infections.

Systemic antifungal therapy was used in corneal ulcers with deep stromal involvement, ulcers extending to the limbus, or if any evidence of anterior chamber involvement. Fluconazole 200 mg tablets were given twice a day for at least a period of 15 days. Liver function tests were done, before starting systemic fluconazole. Blood sugars were monitored and treatment given.

Debridement of the ulcer was done under topical anesthesia on a slit lamp using Bard-Parker blade No. 15 to help better penetration of drugs until the ulcer showed a decrease in infiltration.

Figure 1: Corneal Ulcer At Presentation

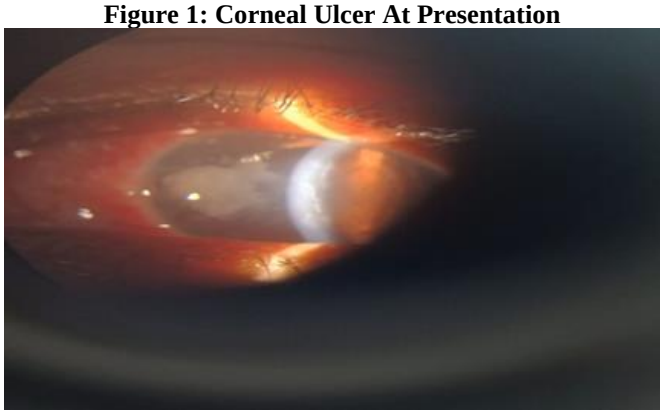

Figure 2: Healed Corneal Ulcer

III. Result

A total of 30 patients were included in the study. The following observations were done and the results were obtained.

The majority of patients were in the age group of the working population from 40 -75 years

The majority of the patients (22) in this study were males and the rest of the 8 patients were females . Chart 1

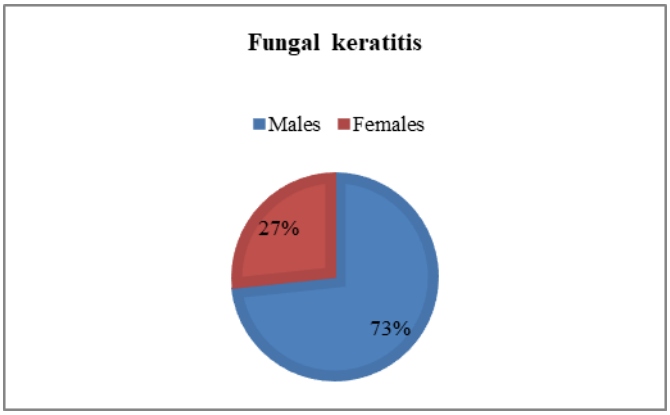

Chart 1 Gender distribution

Most of the patients were farmers (98%) and other occupations include homemakers, carpenters. Chart 2

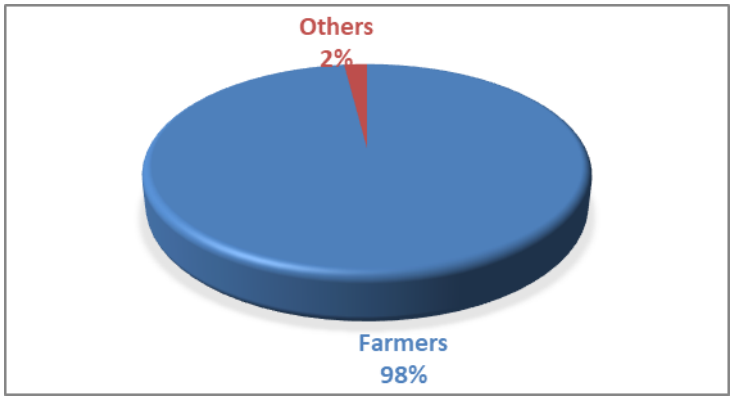

Chart 2 Occupation

Precipitating and risk factors -Trauma with the vegetative matter was the main reason in the majority of patients i.e. 24 patients, in 3 patients there was the history of stone fallen in the eye, in 2 patients there was a history of trauma with other agents like animal tail, fingernail. no history of trauma was seen in 1 patient. Chart 3

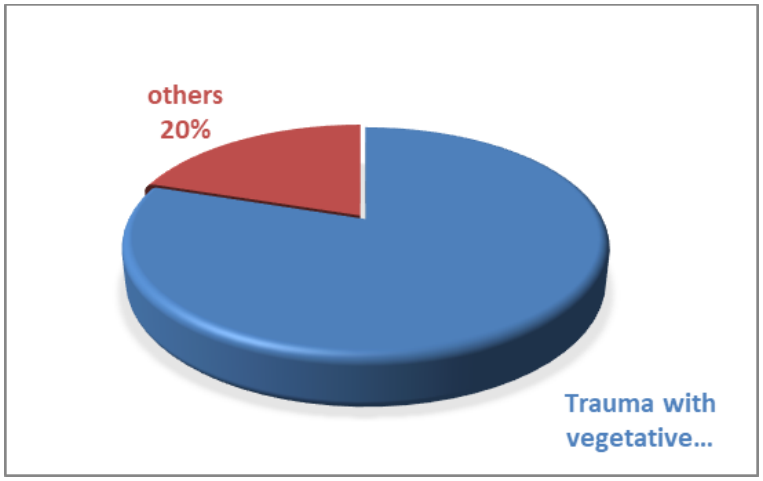

Chart 3: Predisposing factors

In this study, all patients were fungal positive. 21 patients had only fungal elements positive in Gram's stain, 9 patients had both fungal elements, and bacteria positive.

A total of 20 patients were put on systemic fluconazole 200mg tablets for at least a period of 2 weeks. In 12 patients ulcer debridement was done.

26 patients had VA ranging from 3/60 to 6/60 at presentation (Table 1). Most of them were central in location. 4 patients had visual acuity between 6/36 to 6/6 at presentation (Table 2). These ulcers Were either paracentral or peripheral in location and involved the anterior stroma.

Most of them healed and at 8 weeks follow up they had improvement in visual acuity. Only 2 patients, whose ulcers do not shows signs of healing after 2 weeks of treatment were referred to higher center for further management.

Table 1: Visual activity at presentation

Day 1 activity	No. of cases
3/60 - 6/60	26
6/36 - 6/6	4
Total	30

Table 2: Visual activity at the end of 8 weeks

Day 1 activity	No. of cases
6/36 – 6/18	18
6/12 – 6/6	12
Total	30

IV. Discussion

A fungal corneal ulcer classically presents as a dry, raised lesion with feathery borders, presence of satellite lesions, and a hypopyon.

Eye trauma with the vegetative matter is the most risk factor that can predispose to fungal keratitis.Other risk factors include contact lens wear, previous ocular surgery, topical steroid use, and immunosuppression.

Patients with a fungal corneal ulcer will complain of Eye pain, light sensitivity, red eyes, and possibly reduced vision. [12]

Conventional methods for the diagnosis of fungal keratitis include staining of tissue scrapings with Gram-stain, 10% potassium hydroxide (KOH) wet mount, lactophenol cotton blue, Giemsa, or calcofluor white. KOH is one of the most commonly performed direct microscopy procedures for the detection of fungi since it is a rapid and inexpensive procedure with more sensitivity and specificity. [10] The sensitivity of KOH preparation in our study was 100%. In another study done in Iran, it was found to be 71.4%.[11]

All patients in this study were KOH positive suggesting fungal etiology. Gram's stain was done to find out the bacterial etiology in case of mixed infections. In this study, 70% of cases were pure fungal isolates whereas 30% were mixed infections.

The culture of causative fungus from ulcer scrapings takes weeks, so the treatment is started immediately based on clinical diagnosis and detecting the fungus in potassium hydroxide (KOH) mounting rather than waiting for culture report. Early diagnosis and treatment are important in preventing further complications. [4]

Most patients were diabetics with uncontrolled sugars, which can delay the healing of ulcers. Strict glycemic control with good balanced diet becomes essential.

Fungal ulcers were healed mostly after 1 month of treatment. Early usage of topical Natamycin eye drops helps in early recovery. Fungal keratitis have poor visual prognosis despite treatment, because of the resultant corneal scar of varying density

Counseling the patients regarding the severity of the ulcer and importance of follow-ups is essential.

Educating the farmers regarding the protective eye wear during outdoor activities can decrease the burden. Early first time visit to doctor plays a key role in the outcome of vision.

V. Conclusion

Fungal keratitis is treated based on clinical diagnosis supported by the presence of fungus in (KOH) mounting, rather than on culture report because culture takes time. Surgical debridement of the ulcer in the initial stages helps in reducing microbiological load and drug penetration.

Rapid diagnosis and immediate treatment with antifungals are necessary to prevent ocular morbidity and blindness.

Prevention, early diagnosis and treatment of fungal keratitis can improve the visual prognosis of patients, and reduce the blindness rate.

References

[1] Srinivasan M, Gonzales Ca, George C, Cevallos V, Mascarenhas Jm, Asokan B, Et Al Epidemiology And Aetiological Diagnosis Of Corneal Ulceration In Madurai, South India Br J Ophthalmol.

[2] Vemuganti Gk, Garg P, Gopinathan U, Naduvilath Tj, John Rk, Buddi R, Et Al Evaluation Of Agent And Host Factors In Progression Of Mycotic Keratitis: A Histologic And Microbiologic Study Of 167 Corneal Buttons Ophthalmology. 2002;109:1538–46

[3] Bharathi Mj, Ramakrishnan R, Vasu S, Meenakshi R, Palaniappan R. Epidemiological Characteristics And Laboratory Diagnosis Of Fungal Keratitis. A Three-Year Study Indian J Ophthalmol. 2003;51:315

[4] Chang Hy, Chodosh J. Diagnostic And Therapeutic Considerations In Fungal Keratitis Int Ophthalmol Clin. 2011;51:33–42

[5] Keay Lj, Gower Ew, Iovieno A, Oechsler Ra, Alfonso Ec, Matoba A, Et Al Clinical And Microbiological Characteristics Of Fungal Keratitis In The United States, 2001-2007: A Multicenter Study Ophthalmology. 2011;118:920–6

[6] Chander J, Singla N, Agnihotri N, Arya Sk, Deep A. Keratomycosis In And Around Chandigarh: A Five-Year Study From A North Indian Tertiary Care Hospital Indian J Pathol Microbiol. 2008;51:304–6

[7] Gupta Ap, Hake Gh, Kumbhalkar Dt, Madan A. Clinicopathological Study Of Recipients' Corneal Tissue Excised During Penetrating Keratoplasty. Best Out Of Waste!. 2018;3(3)116-123.Doi: 10.18231/2456-9267.2018.

[8] Kenia Vp, Kenia Rv, Pirdankar Oh. Diagnosis And Managment Protocol Of Acute Corneal Ulcer. Int J Health Sci Res. 2020;10(3)69

[9] Jisha K, Sreekumari P, Rajesh P, Jacob K, Jayalekha B. Fungal Corneal Ulcers- A Prospective Study On The Causative Fungus And The Response To The Present Treatment Protocol. J Evol Med Dent Sci. 2016;5;1822-1827

[10] Nayak N. Fungal Infections Of The Eye- Laboratory Diagnosis And Treatment. Nepal Med Coll J. 2008;10(1)48-63

[11] Sharma S, Silverberg M, Mehta P, Gopinathan U, Agrawal V, Naduvilath Tj, Et Al Early Diagnosis Of Mycotic Keratitis: Predictive Value Of Potassium Hydroxide Preparation Indian J Ophthalmol. 1998;46:31–

[12] Maharana Pk, Sharma N, Nagpal R, Jhanji V, Das S, Vajpayee Rb. Recent Advances In Diagnosis And Management Of Mycotic Keratitis. Ind J Ophthalmol. 2016;64(5)346.Doi: 10.4103/0301-4738.185592