

*Research Article***Clinical Profile and Treatment Outcomes of Infective keratitis****Khaled M. Mourad, Mohamed F. Othman, Ahmed A. Abdelghany and Nabila A. Aboeleyon**

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Abstract

Introduction: Infective corneal ulcer is a serious condition that requires prompt and appropriate management to ensure the best visual outcome for the patient.^[1] Corneal infections are the leading cause of monocular blindness in some developing countries, Despite the availability of a wide range of newer antimicrobials and new diagnostic techniques, infective corneal ulcer continues to pose a diagnostic and therapeutic challenge.^[2] **Aim of the study:** To study microbiological etiology, epidemiological factors, clinical profile and treatment outcomes of infective keratitis. **Patients and Methods: Study Design:** A prospective cross-sectional observational study. **Study Population:** The study was done in Minia University hospital ophthalmology department on cases of infective keratitis (150 cases) from October 2018 to April 2020), Corneal scrapings was performed under sterile aseptic conditions and processed for smear and culture in appropriate media using standard laboratory protocols.

Keywords: Infective keratitis, corneal ulcer, best visual

Introduction

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Aim of the study

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Patients and Methods

Study Design: A prospective cross-sectional observational study.

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culture in appropriate media using standard laboratory protocols.

Ethical consideration:

All patients included in this study were informed about the details and nature of the study. An informed written consent to be involved in the study was obtained from each patient or their legal guardian after it was determined that they met the inclusion criteria. Approval of the ethical committee of the faculty of medicine Minia University was obtained. **Inclusion criteria:** All recent infective keratitis regardless age or sex.

Exclusion criteria:

- 1- Healed corneal infection.
- 2- Non Infective causes of keratitis.

Results**1- Demographic data & basic characteristics:**

This study included 150 eyes of 150 patients with a range from 12-85 years, most of the patients (73cases, 48.7%), were of age more than 60 years

Distribution of the studied cases according to age (years) (n =150)

| | Total (n=150) | |
|--------------------|--------------------------|-------|
| Age (years) | | |
| Mean±SD (Range) | 53.25±19.71 (12-85) | |
| Age group | | |
| < 20 | 13 | 8.7% |
| 20 - 29 | 11 | 7.3% |
| 30 - 39 | 5 | 3.3% |
| 40 - 49 | 16 | 10.7% |
| 50 - 59 | 32 | 21.3% |
| ≥ 60 | 73 | 48.7% |

Sixty percent (90cases) were males and 40% (60cases) were females

Distribution of the studied cases according to Gender (n = 150)

| | N | % |
|---------------|----------|----------|
| Gender | | |
| Male | 90 | 60% |
| Female | 60 | 40% |

92 patients had a history of trauma to eye with plant origin

Microbiological investigation of samples of the142 eyes showed positive culture results in 83 cases (58.4 %). Pure bacterial growth was isolated from 23 cases (16.1 %). Pure fungal growth was isolated from 60 cases (42.2%). Mixed bacterial and fungal growth was found in two cases (1.4%).

Distribution of the studied cases according to culture results.

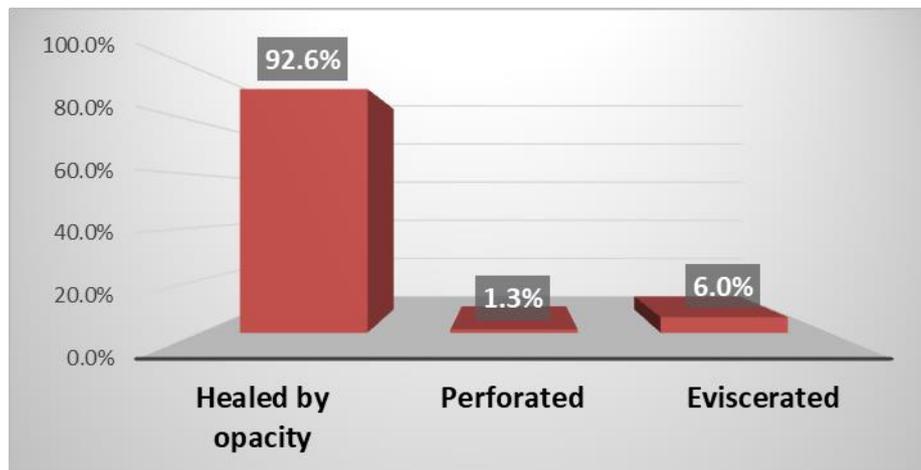
| Investigation | No | % |
|---|-----------|--------------|
| Culture: | | |
| Positive | 83 | 58.4% |
| Negative | 59 | 41.5% |
| Bacterial: | 23 | 16.1% |
| <i>staphylococcus aureus</i> | 13 | 9.1% |
| <i>Pseudomonas</i> | 6 | 4.2 % |
| <i>strept non hemolytic</i> | 4 | 2.8% |
| Fungal | 60 | 42.2% |
| <i>Aspergillus flavus</i> | 24 | 16.9% |
| <i>Aspergillus niger</i> | 15 | 10.5% |
| <i>Aspergillus fumigatus</i> | 14 | 9.8% |
| <i>Candida</i> | 7 | 4.9% |
| Mixed(<i>Aspergillus niger</i> + staphylococcus aureus) | 2 | 1.4 |

The success rate for management in our study Was defined as improvement of the signs and symptoms of the case and complete healing of the keratitis by scarring was as follow: 139

cases (92.6%) are completely healed, 9 cases (6%) unfortunately were eviscerated (1 cases was post cataract surgery;early postoperative, 2 cases known as pseudomonas by microbio-

logical examination, 3 cases were aspergillus niger by microbiological examination and 3 cases were negative results by microbiological examination) and was badly presented from the start with almost melted cornea before starting

treatment, two cases(1.3%) were perforated and sent for graft (one cases undergo amniotic membrane graft and the other undergo scleral graft.



The Distribution of the studied cases according to outcome of treatment

Discussion

Methods for rapid detection of microbial agents and confirmation of clinical diagnosis are very important in the management of infective corneal ulcer. The common laboratory techniques for identifying microbial agents causing corneal infections are culture and direct microscopic smear examinations of the corneal scrapes^[3]

Trauma by vegetative matter of the corneal tissue was the most significant risk factor of infective corneal ulcers (61.3% of the cases), This is in agreement with Basak et al.,^[4]

Pure fungal growth was the most prevalent culture result (41.6%) followed by pure bacterial growth (15.9%). In 1.3% of the cases, a mixed growth of bacterial and fungal was found. In 40.9% of the cases, cultures were negative. The results reveal that infective corneal ulcer cases due to fungal infections were more common than those due to bacterial infections. This finding correlates well with what was previously reported by Basak et

al.,^[4,5] who reported that fungus was found in 59% of cases, bacteria in 42%, Etiological pattern of corneal ulceration varies with geographic region, climate and tends to vary over time.^[6]

Summary & Conclusion

Infective corneal ulcer is an ocular emergency that requires prompt and appropriate management to ensure the best visual outcome for the patient, Thus, careful clinical examination, aided by laboratory investigations, could help in correct diagnosis and proper management.

The mainstay of management of infective corneal ulcers is; early identification of pathogens and proper selection of antimicrobials.

Many clinicians tend to treat empirically, without initially collecting cultures, whereas such laboratory investigations prior to treatment remain the standard of care at hospitals and University Medical Centers.

The present study is prospective non comparative study of 150 eyes of 150 patients of infective corneal ulcers attending the outpatient clinic of the Ophthalmology Department, Minia University.

Most of infective corneal ulcers in our study are related to fungal infection, although bacterial and less frequently mixed infection can also be involved in the pathological process. Fungal keratitis is most commonly caused by aspergillus species.

Although certain clinical features appear to be strongly associated with various types of infective corneal ulcers and you may need to start empirical treatment in many situations to save the eye, But it is not wise to depend on clinical features to reach a presumptive diagnosis. Further investigations to refine these clinical features are very important to validate the proposed scheme in different settings.

References

- 1- Bharathi MJ, Ramakrishnan R, Meenakshi R, Mittal S, Shivakumar C, Srinivasan M. Microbiological diagnosis of infective keratitis: comparative evaluation of direct microscopy and culture results. *Br J Ophthalmol* 2006; 90(10):1271–6.
- 2- Thomas PA, kalamurthy J, Geraldine P. Epidemiological and Microbiological Diagnosis of Suppurative Keratitis in Gangetic West Bengal, Eastern India. *India J Ophthalmol* 2005; 53:143.
- 3- Xie L, Dong X, Shi W. Treatment of fungal keratitis by penetratin keratoplasty. *Br J Ophthalmol* 2001; 85:1070–1074.
- 4- Basak SK, Basak S, Mohanta A, Bhowmick A. Epidemiological and microbiological diagnosis of suppurative keratitis in Gangetic West Bengal, eastern India. *Indian J Ophthalmol* 2005;53:17-22.
- 5- Deorukhkar S, Katiyar R, Saini S. Epidemiological features and laboratory results of bacterial and fungal keratitis: A Five -year study at a rural tertiary-care hospital in Western Maharashtra, India. *Singapore Med J* 2012;53:264-271.
- 6- Panda A, Satpathy G, Nayak N, Kumar S, Kumar A. Demographic pattern, predisposing factors and management of ulcerative keratitis: evaluation of one thousand unilateral cases at a tertiary care centre. *Clin Experiment Ophthalmol* 2007; 35:44-50.