

## TO STUDY THE RESULT OF EMPIRICAL TREATMENT OUTCOME OF CORNEAL ULCER PATIENTS WHO REFUSED CORNEAL SCRAPING IN EASTERN PART OF RURAL INDIA

Debdas Mukherjee<sup>1</sup>, Khevna Patel<sup>2</sup>, Nivedita Choudhury<sup>3</sup>, Alok Kumar<sup>4</sup>, Debtanu Mukherjee<sup>5</sup>

<sup>1</sup>Professor, Department of Ophthalmology, MGM Medical College, Kishanganj, Bihar.

<sup>2</sup>Junior Consultant, Department of Ophthalmology, BKG Malda Eye Hospital Pvt. Ltd., Malda, West Bengal.

<sup>3</sup>Associate Professor, Department of Ophthalmology, MGM Medical College, Kishanganj, Bihar.

<sup>4</sup>Fellow, Department of Ophthalmology, BKG Malda Eye Hospital Pvt. Ltd., Malda, West Bengal.

<sup>5</sup>Resident Medical Officer, Department of Ophthalmology, BKG Malda Eye Hospital Pvt. Ltd., Malda, West Bengal.

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### ABSTRACT

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#### AIM

To study the epidemiological characteristics, predisposing factors and treatment outcome of corneal ulcer in consecutive 150 patients who refused corneal scraping for microbiological examination in eastern part of rural India.

#### METHOD

It was a prospective study, which was conducted on 150 patients presenting with corneal ulcer. These patients refused corneal scraping for their apprehension for the further damage to eye. The study was conducted from March 2014 to March 2015. Demographic factors such as age, sex, occupation and predisposing factors were also recorded.

#### RESULTS

A total of 150 patients with corneal ulcer were enrolled in the study. Majority of patients were in the age group of 41-50 (22%) years followed by patients in the age group 31-40 (21%) years. 77.33% patients were males and 22.67% were females. 63 (42%) were farmers, 14 (9%) were labourers. Most common traumatic agent was paddy leaf 62 (41%). Most patients presented with mild corneal ulcer 90 (61%), followed by severe corneal ulcer with hypopyon 38 (25%). Maximum patients already had taken treatment earlier before their first visit to our hospital, out of which maximum patients received unknown treatment from quacks (42%) followed by steroid use (14%). As per month wise distribution, maximum cases were found in December 28 (19%) followed by month of January 20 (13%). Maximum patients recovered with our treatment 84 (56%).

#### CONCLUSION

Corneal ulcer is a serious eye problem in rural areas, which may cause severe visual morbidity if not blindness. It must be treated very energetically to reduce ocular morbidity. In rural India, most cases are mixed infection and standard book/teaching managements of corneal ulcer are often scary to the illiterate village people, so the patients should be started on simple empirical therapy in order to prevent ocular morbidity and complication. A community-based awareness should be done to prevent corneal ulcer.

#### KEYWORDS

Epidemiology, Corneal Ulcer, Empirical Therapy.

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**HOW TO CITE THIS ARTICLE:** Mukherjee D, Patel K, Choudhury N, et al. To study the result of empirical treatment outcome of corneal ulcer patients who refused corneal scraping in eastern part of rural India. *J. Evid. Based Med. Healthc.* 2016; 3(67), 3649-3653. DOI: 10.18410/jebmh/2016/783

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**INTRODUCTION:** Corneal ulcer is one of the most common cause of preventable blindness, particularly in developing countries like India. According to the World Health Organization, in India, approximately 6.8 million people have been estimated to have vision less than 6/60 in at least one eye due to corneal diseases. Of these, about a million have bilateral involvement.<sup>[1],[2]</sup> A current report on the causes of blindness worldwide consistently lists corneal scarring second only to cataract as the major aetiology of blindness

and visual disability in many of the developing nations in Asia, Africa, and the Middle East.<sup>[3]</sup> Epidemiologic and aetiological pattern of corneal ulceration varies with the geographic location, patient population, and climate, and it tends to vary over time.<sup>[4]</sup> Corneal ulcer is a common, potentially vision-threatening ocular infection that may be caused by bacteria, fungi, viruses or parasites. Hence, an understanding of the epidemiological features, risk factors and aetiological agents that occur in a specific region are important in rapid recognition, timely institution of therapy, optimal management and prevention of this disease. Majority of patients belong to rural areas who are dependent on agriculture as their source of income and agricultural trauma is the leading cause of ulcer. The corneal ulcer is more common in harvest season. Treatment of corneal ulcer is difficult due to various reasons.

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*Financial or Other, Competing Interest: None.*  
*Submission 29-07-2016, Peer Review 05-08-2016,*  
*Acceptance 19-08-2016, Published 22-08-2016.*  
*Corresponding Author:*  
*Dr. Khevna Patel,*  
*BKG Malda Eye Hospital Pvt. Ltd.,*  
*Mokdumpur, Gour Road (Near Bimal Das Statue),*  
*Malda-732103, West Bengal.*  
*E-mail: khevna9@yahoo.com*  
*DOI: 10.18410/jebmh/2016/783*

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In a vast agricultural country like India, particularly where primary health care and referral systems are weak, minor eye injuries sustained in agricultural farms often lead to infectious corneal ulceration and loss of vision. Condition is worse in rural areas not only in high incidences but also due to late presentation to an ophthalmologist. Injudicious use of steroids by rural doctors makes the condition worse. Availability of investigations like microbiological evaluation and culture sensitivity, necessary for proper management is limited in rural areas, this is also a serious constrain. The main bulk of patients were from rural areas who cannot afford the investigation and who cannot have regular followups. Moreover, they are apprehensive for proper scraping for bacteriological yields. Many of them think it might cause further damage to their eyes. In these situations, they prefer rural quacks once again. Hence, the present study was undertaken to analyse the epidemiologic features, predisposing factors and empirical treatment outcome of corneal ulcers.

**MATERIAL AND METHODS:** The study was conducted on 150 patients presenting with corneal ulcer and having symptoms of diminution of vision, pain, redness, watering, photophobia. The study was conducted in our institute from March 2014 to March 2015. Institutional ethics committee clearance was obtained before the start of the study. Patients' written consent were obtained and a standardised detailed history and examination of the patients were taken regarding demographic features, time of onset of symptoms, predisposing factors including corneal injuries (Agriculture, Non-agriculture, Foreign bodies), contact lens wear, Eye lid abnormalities (Blepharitis, entropion, ectropion, lagophthalmos, and others). Patient's visual acuity was recorded at presentation with Snellen's chart and detailed slit-lamp evaluation were done at presentation and at all visits. The size of the epithelial defect after staining with 2% fluorescein were measured and recorded in millimetres.

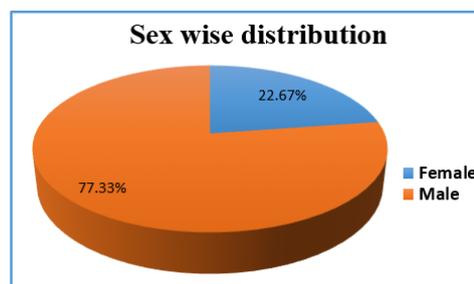
In similar fashion, the size and depth of the stromal infiltrates were recorded. A sketch of each ulcer was drawn on the form using standardised frontal and cross-sectional diagram to record the size, depth and location of ulcer along with examination of margins, floor and infiltrations. Presence and absence of hypopyon were noted (Fig no1). Anterior chamber inflammation was also noted. The use of previous topical medications like antibiotics or corticosteroid were also noted. The following categories of ulcers were excluded: viral ulcers, healing ulcers, Mooren's ulcer, marginal keratitis, interstitial keratitis and atheromatous ulcers. In our study, scraping was not performed because these patients were very apprehensive and so we started the all the patients with corneal ulcer on empirical therapy (Gatifloxacin 0.3%), (Natamycin 5%), (Itraconazole 1%) and (Atropine sulphate 1%) and patients were also given adjuvant therapy such as timolol maleate, 5% sodium chloride solution. We followed up the patients every week till the sign of improvement. At all follow-up visits, patients' visual acuities and slit-lamp examinations were performed.

**RESULTS:** A total of 150 patients with corneal ulcers were enrolled in the study. Majority of patients were in the age group of 41-50 (22%) years followed by patients in the age group 31-40 (21%) years [Table 1].

Age Group	No. of Patients	Percentage
01-10	9	6%
11-20	14	9%
21-30	24	16%
31-40	31	21%
41-50	33	22%
51-60	20	13%
61-70	13	9%
71-80	4	3%
81-90	2	1%
<b>Total</b>	<b>150</b>	<b>100%</b>

**Table 1: Age wise Distribution of Patients**

Out of 150 patients, 77.33% patients were males and 22.67% were females [Chart 1].



**Chart 1: Age wise Distribution of Patients**

The predominance of corneal ulceration in males was most pronounced. Occupation profile of the study mainly comprised of farmers 63 (42%), followed by labourers 14 (9%) [Table 2].

Occupation	No. of Patients	Percentage
Child	6	4%
Driver	4	3%
Electrician	10	7%
Factory Worker	10	7%
Farmer	62	41%
Housewife	10	7%
Labourer	14	9%
Salesman	5	3%
Student	6	4%
Teacher	1	1%
Unknown/Unemployed	11	7%
Welder	11	7%
<b>Total</b>	<b>150</b>	<b>100%</b>

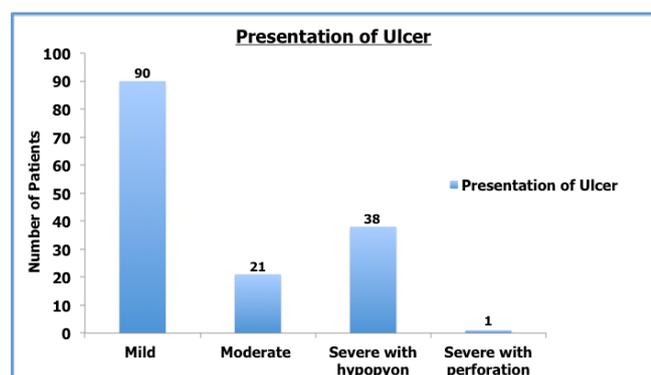
**Table 2: Occupation wise Distribution**

Most common traumatic agent was paddy leaf 62 (41%) since maximum patients were farmers working in paddy field [Table 3].

Traumatic Agents	No. of Patients	Percentage
Cowtail	3	2%
Fingernail	2	1%
Foreign body	16	11%
Paddy leaf	62	41%
Rod	1	1%
Stone	5	3%
Thorn	3	2%
Toy	1	1%
Unknown	55	37%
Wire	2	1%
<b>Total</b>	<b>150</b>	<b>100%</b>

**Table 3: Traumatic Agents**

Most patients presented with mild corneal ulcer 90 (61%) followed by severe corneal ulcer with hypopyon 38 (25%) and moderate corneal ulcer without hypopyon 21 (14%) [Chart 2].



**Chart 2: Presentation of Ulcer among Patients**

Maximum patients already had taken previous treatment before their first visit to us, out of which maximum patients received unknown treatment from quacks (42%) followed by steroid use (14%) [Table 4].

Prior Treatment	No. of Patients	Percentage of Patients
Moxifloxacin, Atropin Sulphate	5	3%
Ciprofloxacin	11	7%
Herbal Medicine	3	2%
Moxifloxacin, Chloramphenicol	5	3%
Moxifloxacin, Tobramycin, Natamycin	1	1%
Moxifloxacin, Tobramycin, Atropin Sulphate	8	5%

Moxifloxacin, Atropin Sulphate, Gancyclovir	2	1%
Moxifloxacin, Natamycin, Itraconazole, Atropin Sulphate	1	1%
Moxifloxacin, Natamycin, Tobramycin, Itraconazole, Atropin Sulphate	5	3%
Moxifloxacin, Natamycin, Atropin Sulphate, Timorite	2	1%
Moxifloxacin, Natamycin, Atropin Sulphate	9	6%
Moxifloxacin, Atropin Sulphate, Itraconazole	2	1%
Natamycin, Atropin Sulphate	3	2%
No T/T taken	7	5%
Steroid	14	9%
Unknown T/T by Hospital	3	2%
Unknown T/T by quack	63	42%
Gatifloxacin, Natamycin, Atropin Sulphate, Timolol Maleate	6	4%
<b>Total</b>	<b>150</b>	<b>100%</b>

**Table 4: Represents Prior Treatment Taken by Patients Before Making Their First Visit**

Month	No. of Patients	Percentage
Jan	20	13%
Feb	8	5%
March	12	8%
April	11	7%
May	11	7%
June	17	11%
July	8	5%
August	5	3%
Sept	11	7%
Oct	8	5%
Nov	11	7%
Dec	28	19%
<b>Total</b>	<b>150</b>	<b>100%</b>

**Table 5: Month Wise Distribution of Corneal Ulcer Among the Patients**

As per month wise distribution, maximum cases were found in December 28 (19%), followed by month of January 20 (13%). These two months were the harvesting time [Table 5].

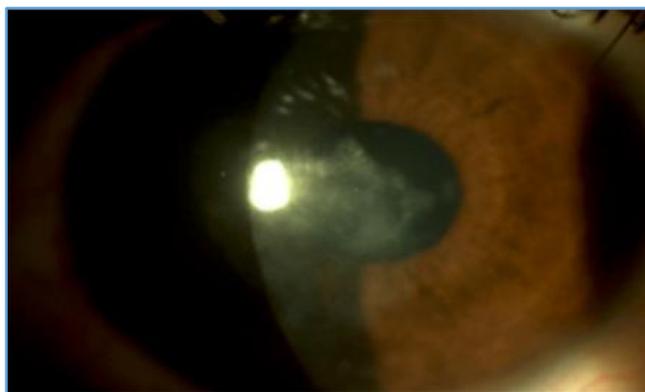
Maximum patients recovered with our treatment. Patients recovered, maintained ocular integrity and variable amount of corneal opacities with our treatment were 87 (58%) [Table 6].

Outcome of Treatment	No. of Patients	Percentage
Lost to follow-up	26	17%
Recovered	87	58%
Referred	26	17%
Stationary	9	6%
Worsened	2	1%
<b>Total</b>	<b>150</b>	<b>100%</b>

**Table 6: Shows Outcome of Treatment**



**Figure 1: Corneal Ulcer with Hypopyon**



**Figure 2: Healed Corneal Ulcer after treatment**

**DISCUSSION:** Corneal ulceration and subsequent corneal scarring are at present a leading cause of ocular morbidity and unilateral blindness in developing countries. Our study included 150 patients and various demographic factors were studied, such as age, sex, and occupation. In the present study, corneal ulceration was seen in all age groups with preponderance among physically active adults in the age group of (41-50) 22%, followed by (31-40) 31%; higher in males (77.3%) than in females (22.7%), Upadhyay M and Srinivasan M et al found the similar findings.<sup>[5],[6],[7],[8]</sup> Majority of patients visiting our hospital belong to nearby rural area (85%), similar findings were reported in the study.<sup>[6],[7]</sup> The majority of the corneal ulcer patients were farmers (41%), followed by labourers (9%) mostly working in paddy fields. Most common traumatic agent was paddy leaf 62 (41%), similar results were reported in other studies.<sup>[8],[9],[10],[11]</sup>

Most of them are agriculture workers as this is the commonest occupation of rural population in developing countries. This explains why agricultural trauma is common in this region; they were also much involved in agricultural activities. Most patients presented with mild corneal ulcer 90 (61%) followed by severe corneal ulcer with hypopyon 38 (25%) and moderate corneal ulcer without hypopyon 21 (14%). Most of the patients were already taking unknown treatment from quacks (63%) followed by steroids use (14%) before coming to this hospital. A significant increase in the number of cases of corneal ulcer was observed during harvesting seasons of November-December (19%) and January (13%).<sup>[12],[13],[14]</sup> Majority of patients were treated with following eye drops Gatifloxacin 0.3% which is a 4th generation fluoroquinolone, broad spectrum which acts on Gram-positive and Gram-negative organisms; Natamycin 5%, a broad spectrum antifungal having activity against candida, Aspergillus, Fusarium and cephalosporin. Itraconazole 1%, a broad-spectrum antifungal acts on Aspergillus, histoplasmosis; and Atropine sulphate 1% is a cycloplegic used to reduce pain and ciliary spasm, and patients were given adjuvant therapy such as timolol, Hypersol. Outcome of patients was majority of patients recovered (58%), 17% of patients were referred to higher centres for further treatment such as keratoplasty.

**CONCLUSION:** Corneal ulcer is a serious eye problem in rural areas, which may cause severe visual morbidities if not blindness. It must be treated very energetically to reduce ocular morbidity. In rural India, most cases are mixed infection clinically and standard book/teaching managements of corneal ulcer are often scary to the illiterate village people. So patients should be started on simple empirical therapy in order to prevent ocular morbidity and complication. A community-based awareness should be emphasised such as Protective goggles at the time of harvesting to prevent corneal ulcers.

**REFERENCES**

1. National Programme for Control of Blindness. Report of National Programme for Control of Blindness, India and World Health Organization. 1986-1989.
2. Dandona R, Dandona L. Corneal blindness in a southern Indian population: need for health promotion strategies. Br J Ophthalmol 2003;87(2):133-141.
3. Thylefors B, Negrel AD, Pararajasegaram R, et al. Available data on blindness (update 1994). Ophthalmic Epidemiol 1995;2(1):5-39.
4. Burd EM. Bacterial keratitis and conjunctivitis-bacteriology. In: Smolin G, Thoft RA, eds. The cornea: scientific foundations and clinical practices. 3<sup>rd</sup> edn. Boston: Little Brown 1994:115-124.
5. Reddy PS, Satyendra OM, Satpathy M, et al. Mycotic keratitis. Indian J Ophthal 1972;20(3):101-108.

6. Bharathi MJ, Ramakrishna R, Vasu S, et al. Aetiological diagnosis of microbial keratitis in south India- a study of 1618 cases. *Indian J Med Microbiol* 2002;20(1):19-24.
7. Upadhyay M, Purna C, Karmacharya S, et al. Epidemiologic characteristics, predisposing factors, and etiologic diagnosis of corneal ulceration in Nepal. *Am J Ophthalmol* 1991;111(1):92-99.
8. Srinivasan M, Gonzales CA, George C, et al. Epidemiology and aetiologic diagnosis of corneal ulceration in Madurai, south India. *Br J Ophthalmol* 1997;81(11):965-971.
9. Basak SK, Basak S, Mohanta A, et al. Epidemiological and microbiological diagnosis of suppurative keratitis in gangetic West Bengal, eastern India. *Indian J Ophthalmol* 2005;53(1):17-22.
10. Verenkar MP, Borkar S, Pinto MJ, et al. Study of mycotic keratitis in Goa. *Indian J Med Microbiol* 1998;16:58-60.
11. Bashir G, Shah A, Thokar MA, et al. Bacterial and fungal profile of corneal ulcers: a prospective study. *Indian J Pathol Microbiol* 2005;48(2):273-277.
12. Kotigadde S, Ballal M, Jyothiratha, et al. Mycotic keratitis: a study in coastal Karnataka. *Indian J Ophthalmol* 1992;40(1):31-33.
13. Hagan M, Wright E, Newman M, et al. Causes of suppurative keratitis in Ghana. *Br J Ophthalmol* 1995;79(11):1024-1028.
14. Jeng BH, McLeod SD. Microbial Keratitis. *Br J Ophthalmol* 2003;87(7):805-806.