Original Research Article

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A prospective study of clinical profile, epidemiology and etiological diagnosis of corneal ulcer in North-West Rajasthan

Rashmi Kewaliya Joshi, Rekha Kumari Goyal*, Anju Kochar

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

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*Correspondence:

Dr. Rekha Kumari Goyal,

E-mail: mbbsrekha08@gmail.com

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ABSTRACT

Background: To determine clinical profile, epidemiological and etiological diagnosis of corneal ulcer in North-West Rajasthan.

Methods: One hundred thirty three patients who were treated for corneal ulcer were enrolled in this study from February 2015 to May 2017. The historical aspect including symptoms, duration of ulcer and relevant local and systemic predisposing factor and detailed ocular examination were noted. Corneal scrapings were taken up in almost all cases except few cases and sent for microbiological assessment.

Results: 66.9% were males and 33.08% females. Most common age group was between 30-60 years and majority of patients were from rural areas. Most common pathogen was found Aspergillus fumigatus.

Conclusions: Corneal ulcer was seen predominantly in males of 30-60 years of age of rural background. Aspergillus fumigatus being most common etiological organism.

Keywords: Aspergillus fumigatus, Corneal ulcer, Rural area

INTRODUCTION

Corneal ulcer is a sight threatening condition presenting in all age groups and either sex worldwide. It may resolve without any sequelae or progress to perforation and leads to dreaded complication like endopthalmitis and ultimately leads to blindness.

Corneal ulceration is a significant cause of corneal blindness. The spectrum of microbial keratitis varies with geographical location, influenced by the local climate and occupational risk factors. Corneal blindness due to infectious keratitis has been more commonly reported in the rural population, particularly in those belonging to the lower socioeconomic strata and those who are illiterate with poor knowledge about proper eye care. Mycotic keratitis is more common in the tropics and sub-tropical regions, and the major precipitating

factor is trauma, followed by prior application of corticosteroids and traditional eye medicine.³

The use of traditional eye medicines (e.g., dried plant materials crushed into powder and dissolved in an aqueous medium; animal/human products such as breast milk, saliva, urine, etc.) is an important risk factor for corneal ulceration in many developing countries. The use of traditional eye medicines is a public health problem in many developing countries, including India, and an important risk factor for corneal blindness. The traditional eye medicines are often contaminated and usually lead to delay in proper therapy. They also serve as a vehicle or culture media for spread and growth of pathogenic organisms.⁴

The present study was carried out to assess the epidemiological characteristic and prevalence of specific pathogen.

METHODS

One hundred thirty three patients were enrolled in this study who were treated for ulcerative keratitis in Department of Ophthalmology of Sardar Patel Medical College, Bikaner, Rajasthan from February 2105 to May 2017. All patients with infectious corneal ulcer presented to our department were included in our study and those patients who had typical viral ulcer and mooren's ulcer, marginal ulcer or any ulcer associated with autoimmune disease were excluded from the study. In all these patients data regarding their socio-demographics (age, sex, occupation) and detailed history about symptoms and duration of ulcer, history of trauma and relevant systemic condition like diabetes mellitus, immuno-suppression, prolonged hospitalization if any, were asked. Visual acuity where was possible and detailed slit lamp examination was performed to note size of ulcer, depth, extent of infiltrates, corneal thinning and height of hypopyon, scleral extension. Local eye conditions predisposing to corneal ulceration like lagopthalmos, chronic dacrocystitis, trichiasis also were noted.

Corneal scraping was taken in most of cases except of perforated corneal ulcer, corneal thinning and descematocele from edge and base of ulcer under full aseptic measures following instillation of topical anaesthesia and samples were directly inoculated on blood agar, chocolate agar and Sabouraud's dextrose agar and sent to microbiological department for further process. Direct microscopic examination of corneal scraping was done with 10% KOH mount.

Dual empirical therapy was started in all patients. By receiving microbiological reports therapy was changed according to sensitivity reports.

Statistical data analysis done by SPSS 21.

RESULTS

Of the 133 patients, 89 (66.9%) were male and 44 (33.08%) were female (Figure 1) and 13 (9.7%) patients were less than 30 years of age group and 66 (49.6%) in between 30-60 years of age group and rest 54 (40.6%) were above 60 years of age group (Figure 2). Thus male patients belonged to 30-60 years of age group showed greater frequency of corneal ulcer.

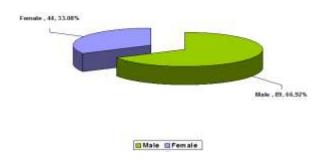


Figure 1: Proportion of males and females.

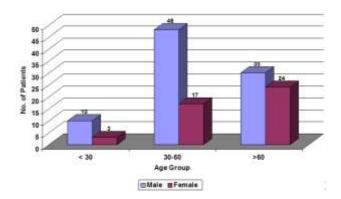


Figure 2: Proportion of males and females among the various age groups of patients.

The major proportion of patients 104 (78.2%) belonged to rural region (Figure 3). With regard to severity of ulceration at the time of presentation 79 patients (59.4%) presented with hypopyon and 15 (11.3%) with perforation and 7 (5.3%) with descematocele (Table 1). Majority of patients presented to us in rainy weather like July to September because this time most of people works in fields.

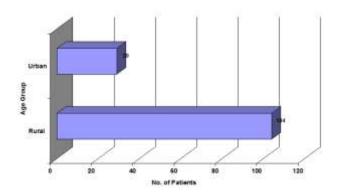


Figure 3: Proportion of patients according to region.

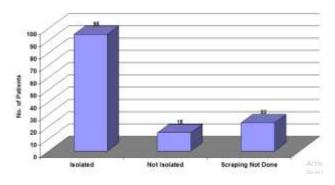


Figure 4: Proportion of patients with positive and negative microbial isolation and culture.

Out of 133 cases, scraping were taken from 110 cases (82.7%) and 23 cases (17.3%) were left due to presence of severe corneal thinning, descematocele and impending perforation.

On analyzing KOH mount, Gram staining and culture sensitivity reports it was found that fungi/bacteria in 95 patients (86.4%) and rest 15 patients (13.6%) showed no growth (Figure 4). Thus 86.4% of patients in this study showed either fungi or bacteria in culture. Among isolates 62 cases (65.3%) showed fungus and rest 33 cases (34.7%) bacteria. Of the fungal isolates *Aspergillus* was found most common in 53 cases (55.8%) and

followed by *Fusarium* in 4 cases (4.2) and Candida in 2 cases (2.1%) and *Rhizopus* in 1 case (1%) and *Alternaria* in 1 case(1%) and in bacterial isolates, most common growth was found of *Staphylococcus* in 15 cases (15.6%) followed by *Streptococcus* in 13 cases (13.7%) and *Pseudomonas* in 3 cases (3.2%) and *Klebsiella* in 1 case (1.1%) and 1 case (1.1%) showed both *Staphylococcus* and *Streptococcus* (Figure 5).

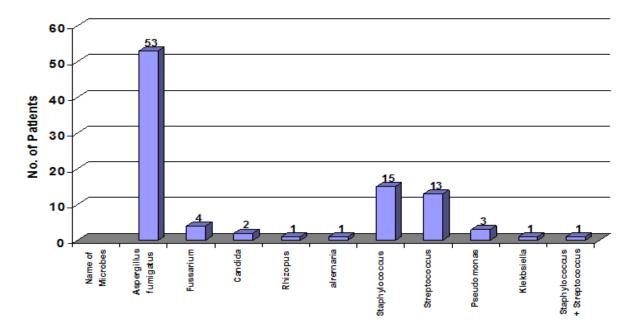


Figure 5: Proportion of patients with specific microbial isolates in positive culture.

Table 1: Proportion of patients at time of presentation.

Hypopyon	Perforation	Descematocele	Central or pheripheral ulcer
79	15	7	32
59.4%	11.3%	5.3%	24.1%

With regards to recovery, majority of patients responded well to our therapy and only few cases showed sign of worsening. Those cases showed sign of worsening who had history of using traditional eye medicine mostly saliva and late presentation to hospitals.

DISCUSSION

Cataract and corneal diseases are major causes of blindness in countries with less developed economies.⁵ According to World Health Organization corneal diseases are among the major cause of vision loss and blindness in world today after cataract and glaucoma.⁶ With the worldwide decrease in trachoma and other traditional causes of blindness, such as onchocerciasis and leprosy, the World Health Organization has recognized that microbial keratitis is emerging as an important cause of visual disability.⁷ By extrapolation of Indian estimates of

the incidence of corneal ulcer, approximately 1.5-2 million people develop corneal ulcer annually in our country.

In our study males had higher incidence of corneal ulcer (66.9%) than females. This is in conformity with the several studies conducted elsewhere like Srinivasan et al and Bashir et al. ^{8,9} This could be explained by fact that they are more involved in outdoor activities hence exposed to unfavourable circumstances like trauma due to vegetative matter in farmers and agriculture workers and leading to corneal ulcer. In study by Upadhyaye et al males and females were found to be equally affected. ¹⁰

With regards to age in our study, majority of patients (49.6%) were of 30-60 years of age group. Lapsina et al also concluded same. 11 On basis of microbiological analysis 55.8% of patients showed fungus and most common was *Aspergillus fumigatus*. Chander et al did a study in Northern India also concluded same but In study by Srinivasan et al most common isolates was Streptococcus Pneumoniae. 8,12 *Cogulase negeative Staphylococcus* was most common in Lapsina et al and *Pseudomonas* was in Leck et al. 11,13 The reason for variation could be explained probably due to different climate conditions, socio-economic standards, culture and occupations that are seen in these geographical areas.

CONCLUSION

The major aetiological agent in our study is fungus (Aspergillus) and majority of patients belongs to middle decade (30-60 years of age group) of life and from rural areas. Young patients and those presented earlier responded well in comparison to old age patients and those presented late. Mycotic keratitis continues to be important cause of ocular morbidity mostly in the person inhabiting rural areas involved in outdoor agriculture activities. Young males affected in these circumstances are often the bread earners of their family and blindness in them cause great economical burden in community. Therefore we concluded that early institution of antifungal therapy following meticulous examination and awareness about not using mal practice like tongue cleaning following trauma may limit ocular morbidity and disastrous sequelae among these patients.

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