

## Microbiological Profile of Corneal Ulcers from a Tertiary Care Hospital in R.R District, AP

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Received: 22/11/2013

Revised: 18/12/2013

Accepted: 20/12/2013

### ABSTRACT

**Introduction:** Corneal infection is one of the major causes of blindness worldwide. It accounts for 20-30% of all blindness in developing countries. The purpose of this study is to evaluate the risk factors, mode of presentation of and etiology of corneal ulcers in patients reporting to tertiary care hospital.

**Methods:** 100 patients with infective corneal ulcer presenting to ophthalmology department were included in this study. Corneal scrapings were taken for Gram stain and KOH mount and the specimens were inoculated onto blood agar, chocolate agar, Mac conkey agar & saboraaud's dextrose agar.

**Results:** The most common age group involved was more than 40 years & the most common occupation among the affected individuals was agriculture. Staphylococcus species was the most common bacterial isolate (27%) followed by Pneumococcus (19%). Aspergillus was the most common fungal isolate (7%).

**Conclusion:** corneal ulcer is common in rural population among agricultural workers. Most common predisposing factor is injury. Staphylococcus species was the most common isolate. Most of the cases regress with proper treatment thus; early recognition of causative organisms and prompt use of specific antibiotics and antifungal drugs will bring down the morbidity caused by this disease to a great extent.

**Key words:** corneal ulcer, corneal scrapings, Staphylococcus.

### INTRODUCTION

Corneal infections are the second most common cause of monocular blindness after cataract in some developing countries in the tropics.<sup>[1]</sup> According to world health organization (WHO), corneal diseases are among the major causes of vision loss and blindness in the world today, second only to cataract in overall importance. In India, there are approximately 6.8 million people who have corneal blindness. A recent national survey by the Government of India

(1991-2001) estimated that corneal lesions are responsible for 9% of all blindness in our country.<sup>[2]</sup>

The annual incidence was conservatively estimated to be 11.3 per 10,000 population or at least 10 times more frequent than the incidence of similar infections in the age and sex population in the USA.<sup>[3]</sup> Corneal blindness accounts for 20-30% of all blindness in the developing countries of the world. Infective corneal disease is the leading cause of this problem in Southasia.<sup>[4]</sup>

The purpose of this study is to evaluate the risk factors, mode of presentation and etiology of corneal ulcers in patients reporting to tertiary care hospital.

## MATERIALS AND METHODS

Patients with infectious central corneal ulceration presenting to ophthalmology outpatient and inpatient department of a tertiary care hospital in R.R District were included in this prospective study over a period of 1year.

### **Selection of cases:**

**Inclusion Criteria:** Patients with infectious corneal ulcers presenting to the outpatient and inpatient department were included in the study.

Patients were included after examination & clinical diagnosis of corneal ulcer is made.

**Exclusion Criteria:** Typical viral ulcers, Moorens ulcer, marginal ulcers, interstitial keratitis, sterile neurotropic ulcers, ulcers with autoimmune diseases.

Every patient is examined externally. Patient is then examined at slit lamp biomicroscope by ophthalmologist.

Sample is collected and sent to Microbiology laboratory.

**Collection of sample:** Corneal scrapings were taken from the edge of the ulcer using a sterile 15 no. blade after instillation of topical 4% xylocaine. Scrapings were taken on two glass slides, one for Grams staining and other for KOH mount.

**Culture:** The scrapings were inoculated onto different media like blood agar, Mac conkey's agar chocolate agar, Saborauds Dextrose Agar media, Brainheart infusion broth (BHI), nutrient broth. Samples collected with swab immersed in BHI were examined for turbidity (over night incubation) and then the inoculum was directly 'C'streaked on to plates.

After overnight incubation, bacterial culture was confirmed by growth obtained on blood agar, chocolate agar and mac

conkeys agar and standard biochemical test.<sup>[5]</sup> The fungal culture was confirmed by growth obtained on Saborauds dextrose agar after 5- 10 days of incubation. If fungal growth was present, speciation was done by slide culture and lactophenol cotton blue mount.<sup>[6]</sup>

## RESULTS

Total numbers of cases included in this study were 100.

Males and females affected were 53% and 47% respectively,

The most common age group involved was more than 40 years (55%).

The most common occupation among corneal ulcer patients was agriculture 43%.

Right eye (54%) was most commonly involved compared to left eye (46%).

Central quadrant of cornea was commonly involved 43%.

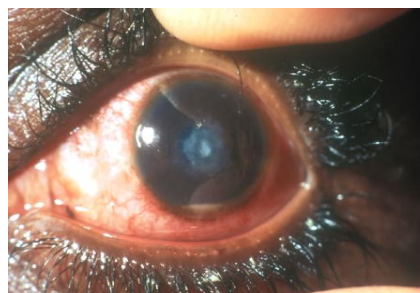


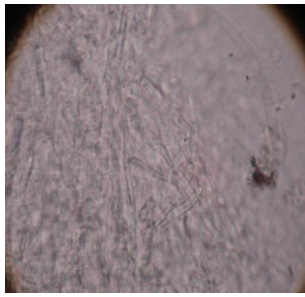
Fig 1: Central corneal Hypopyon.

Hypopyon was present in 29% cases and absent in 71% cases.

On follow up 70% cases were regressive, 4% were progressive, 2% were static and 20% cases had not turned up.

Among the isolated organisms, 56 were bacterial isolates and 10 fungal isolates.

From the bacterial isolates, Gram positive were 46 and Gram negative 10, whereas from the fungal isolates 8 were KOH positive and 10 culture positive.



**Fig 2: Corneal scrapings KOH Mount.**

**Table1: Associated complaints of corneal ulcer.**

Chief complaint	N=100
Pain	87(87)
Redness	75(75)
Watering	66(66)
Diminision of vision	32(32)
Pricking sensation	21(21)

**Table 2: Risk factors associated with corneal ulcers.**

Risk Factor	N=100
Injury	41(41)
Foreign body	20(20)
No predisposing factors	34(34)
Drugs	05(05)

**Table 3 : Organisms isloted from corneal ulcers.**

Organism	N=100
Staphylococcus	27
Pseudomonas	10
Pneumococcus	19
Aspergillus	07
Fusarium	02
Curvalaria	01
Mixed	05
No growth	20
Not taken*	09

\*Not taken – corneal scrapings were not taken.

## DISCUSSION

The prevalence of visual disability from corneal ulcer varies from one geographical location to another. In South India reliable statistics are not available but the incidence of corneal ulceration is 10 times higher than a comparable population in USA.

Considering the importance of ulceration as a worldwide cause of monocular visual loss, there are surprisingly few studies evaluating the aetiological factors predisposing a population to corneal infections.

In this study corneal ulcer is more common in males (53%) than females (47%). Similar results were found by Mathew Green<sup>[7]</sup> and MJ Bharthi<sup>[8]</sup>This is

because most of the males work outdoors and they were mostly agriculture workers thereby being more susceptible to trauma.

In this study corneal ulcer was more common in the age group >41years(55%). This finding is supported by MJ Bharthi<sup>[8]</sup> & Mathew Green<sup>[7]</sup> in whose studies corneal ulcer was more common above 50 years.

From the present study it was observed that 43% of corneal ulcer patients were farmers or agriculture labourers. This is well supported by authors like MJ Bharthi<sup>[8]</sup> and M.Srinivasan.<sup>[9]</sup>

Pain was the most common complaint among the corneal ulcer patients in the present study. Pain is a prominent symptom as suggested by Vinay Agrawal.<sup>[10]</sup>

History of recent injury to cornea was obtained in 41% of patients. Similar history was common in studies conducted by M. Srinivasan,<sup>[9]</sup> Panda A,<sup>[11]</sup> Keay l.<sup>[12]</sup>

In the present study predisposing topical corticosteroid usage was found among 5% of corneal ulcer patients. This is well supported by Panda A.<sup>[11]</sup> This was common in patients who had purchased over the counter without a prescription. This was also inferred by Panda A<sup>[11]</sup> in their study.

In this study Gram positive cocci was seen in 46% of cases and Gram negative bacilli was seen in 10% of cases. MJ Bharti found 65.1% Gram positive cocci and 4.9% Gram negative bacilli in her study.<sup>[8]</sup> Mathew Green found 29% Gram positive cocci and 23% Gram negative bacilli in his study.<sup>[7]</sup>

In this study microorganisms were isolated from 66% of corneal scrapings that were obtained. In studies conducted by Mathew Green<sup>[7]</sup> 65% were culture positive , 68% in studies by M Srinivasan,<sup>[9]</sup> 71.9% in studies by Prashanth Garg<sup>[14]</sup> and 67.7% by Basak SK.<sup>[15]</sup>

In the present study bacteria was predominantly isolated from 56 % of cases, 10% were fungi and 5% mixed. In 20% of

cultures there was no growth. This is well supported by authors like Prashanth Garg MS<sup>[14]</sup> whereas bacteria & fungi were equally obtained in cultures in studies by MJ Bharthi,<sup>[8]</sup> R.Ramakrishnan<sup>[17]</sup> and M Srinivasan.<sup>[9]</sup> Among the bacteria isolated, Staphylococcus species was predominant about 27%, Pneumococcus was 19% & Pseudomonas was 10%. This is well supported by authors like Prashanth Garg MS<sup>[14]</sup> & Friedrich Schaefer.<sup>[16]</sup> Pneumococcus was predominantly isolated in studies conducted by MJ Bharthi<sup>[8]</sup> and M Srinivasan.<sup>[9]</sup>

Among the fungi Aspergillus (7%) was commonly isolated followed by Fusarium species (2%). Others were Curvalaria, Penicillium & dematacious fungi. This compares well with studies by M Srinivasan.<sup>[9]</sup>

## CONCLUSION

Corneal ulcer is common in rural population and it is more common among males. Corneal ulcer is more common in agriculture workers.

Most common predisposing factor is injury and is common among those who have bad hygiene, usage of local medicines and injudicious usage of corticosteroids. The common complaints with which the patients presented were pain, redness and watering. In the present study Staphylococcus species was the most common organism causing corneal ulcers as it is a normal commensal and it is the first organism to enter when there is a breach in the epithelium.

Most of the cases regress with proper treatment thus; early recognition of causative organisms and prompt use of specific antibiotics and antifungal drugs will bring down the morbidity caused by this disease to a great extent.

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How to cite this article: Karthika N, Neelima A, Ramchandran S. Microbiological profile of corneal ulcers from a tertiary care hospital in R.R district, AP. *Int J Health Sci Res.* 2014;4(1):112-116.

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