

Study on Demographic Correlates of Corneal Ulcer among Patients Attending the Tertiary Care Hospital of Jharkhand

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ABSTRACT

Introduction: Corneal ulcer is one of the important causes for ocular morbidity in India. Early presentation with prompt diagnosis and treatment result in good visual rehabilitation. Aim: The aim of this study was to assess the etiology of corneal ulcer among patients attending the tertiary care teaching hospital of Jharkhand.

Material and Methods: This was a prospective observational hospital-based study conducted at the Department of Ophthalmology, at a tertiary care hospital, in Jharkhand. Data related to socioeconomic status, predisposing factor, and course of disease was collected. Results were analyzed on the basis of history, slit lamp examination, and appropriate laboratory investigation.

Result: During the study period of one year, 1013 patients with the clinical diagnosis of corneal ulceration were evaluated, mean age of the patient was 53 years and majority of patients of infectious keratitis were in between 46 and 60 (45%) age group. Incidence in male was higher than (59%) that of female. The left eye was more commonly involved (53%) as compared to the right eye (47%). Farmers (47%) followed by Industrial worker (27%) were most common occupation involved. Incidence of fungal keratitis (42%) was higher than bacterial (31%) and viral (11%).

Conclusion: Proper diagnosis and management of corneal ulcer is very much necessary among exposed population. Incidence of fungal corneal ulcer is very high among agriculture and industrial workers and lack of awareness and poor treatment leads to corneal blindness. Use of protective eye wear, masks and face shields may play a key role in prevention of the disease.

Keywords: Corneal Ulcer, Infective Keratitis, Fungal Corneal Ulcer

among the major causes of vision loss and blindness in the world today, after cataract and glaucoma.⁵ As per the National Program for Control of Blindness (NPCB) data 120,000 persons are suffering from corneal blindness in India currently and 25,000-30,000 corneal blindness cases are added to this number every year.⁶

This study was undertaken to study and evaluate the etiology of corneal ulcers and also to know the various determinants affecting the outcome of the disease. During the study we also tried to generate and analyze various valid and valuable data to have better understanding of the disease.

MATERIAL AND METHODS

This was a prospective observational hospital based study conducted in the Department of Ophthalmology, during June 2017 to May 2018, at a tertiary care hospital, in Jharkhand. Study was conducted after taking proper approval from the Institutional ethics committee in RIMS, under the aegis of declaration of Helsinki. Consent was taken from the participants in their vernal languages in verbal and written form. Inclusion criteria were patients with corneal ulcer, both newly presented and who were under treatment follow up. Exclusion criteria were patients with systemic illness, patients showing signs of post cataract surgery endophthalmitis, Panophthalmitis, treatment defaulters.

A form was filled out for each patient, documenting socio-demographic features, duration of symptoms, predisposing factors, history of corneal trauma, traumatizing agents, associated ocular conditions, other systemic diseases, therapy received prior to presentation, visual acuity at the time of presentation and all the clinical findings.

Patients meeting inclusion and exclusion criteria were examined properly. Visual acuity was recorded and external

INTRODUCTION

Corneal ulcer (Infective keratitis/ Microbial keratitis) is a sight-threatening condition that requires prompt diagnosis and treatment to prevent unfavorable outcomes. Corneal opacities following ulcer are the fourth leading cause of blindness worldwide.^{1,2} So the timely antimicrobial therapy based on clinical and laboratory evaluation is the key determinant for the favorable outcome. Burden of corneal disease is reflected by the fact that 90% of the global cases of ocular trauma and corneal ulceration leading to corneal blindness occur in developing countries.³ The incidence of corneal ulcer in developing countries is around 799 per 100,000 persons/year while in developed countries like United States it is 11.0 per 100,000 persons/year.⁴ According to the World Health Organization, corneal diseases are

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examination was done under slit lamp. Examination of ocular adnexa including lids, eyelashes, and lacrimal sac area was done. The sac syringing was done to check the patency of the lacrimal system, and random blood sugar was recorded to screen for diabetes mellitus in every patient. Comprehensive examination of corneal ulcer as conducted that included the size, depth, and location of ulcer along with examination of margins, floor, and infiltrations. Corneal scraping from margins and base of the lesion was done and send for culture and sensitivity test in department of microbiology. Standard antimicrobial therapy was given based on laboratory reports. Scraping was delayed without treatment for 12 h if antibiotics have instilled previously. Viral keratitis cases were confirmed on basis of clinical findings and fluorescein stain. Corneal re-scraping was done in patients not responding to treatment after 48 hrs of initiation of treatment. Patients not responding to treatment after 7-8 days were labeled as non-healing ulcer. Patients were classified on the best-corrected basis of visual acuity before and after treatment as

Group A: 6/6 to >6/18

Group B: 6/24 to >6/60

Group C: 5/60–1/60

Group D: Counting fingers

Group E: Hand movement (HM) to light perception (PL)

Group F: No Perception of light (No PL).

Pearson's chi-square test was used for the statistical analysis wherever required.

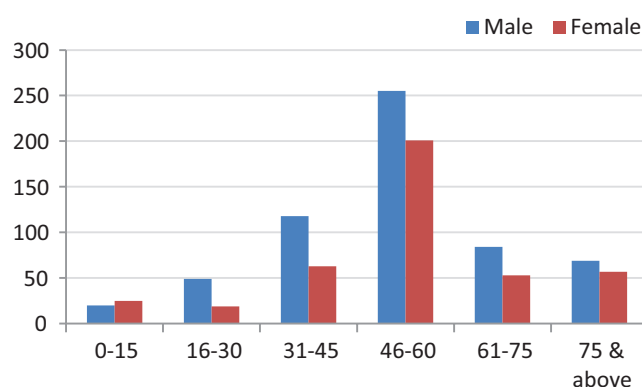
RESULT

During the study period of one year, 1013 patients with the clinical diagnosis of corneal ulceration were evaluated at our institute. The mean age of the patient was 53 years. Majority of patients of infectious keratitis were in between 46 and 60 (45%) age group followed by 31-45 (18%) (Graph 1) and incidence in male was higher than (59%) that of female. The left eye was slightly more commonly involved (53%) as compared to the right eye (47%).

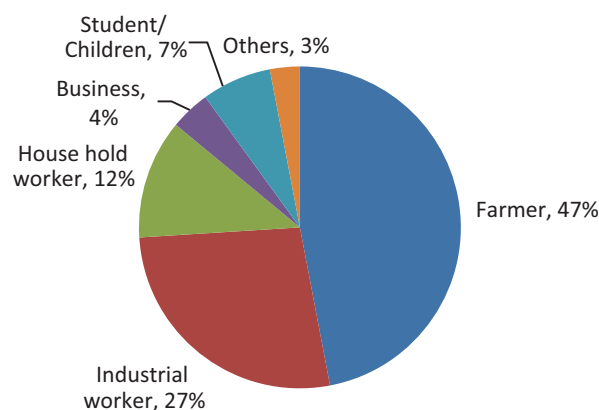
Distribution of patient according to occupation shows majority cases (47%) were farmer followed by Industrial worker (27%). Very small number of patients among business (4%), students/children (7%) and 3% were others [Graph 2]. The incidence of fungal keratitis (42%) was higher than bacterial (31%) and viral (11%) (Graph-3). No growth and mix clinical presentation noted in 16% of cases. Total 47% were new cases and rests were follow up cases.

Among all patients, majority of the patient had BCVA Group E (52%) and Group D (27%) followed by Group C (11%) Group B (7%) Group A (3%) only 2% patient had No PL. Most of the patients visited hospital within 7 days (53%) of the initial symptom. About 24% visited between 8- 14 days and 13% visited after 21 days of initial complaints.

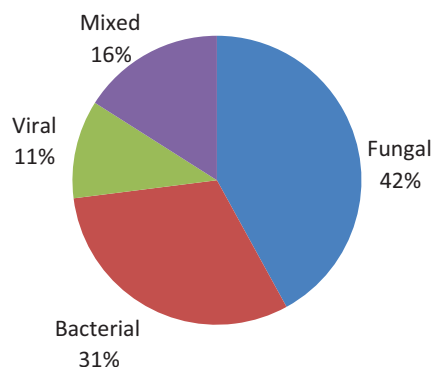
At the time of presentation 42% patients had significant vision-threatening complications, that included corneal perforation in 29% followed by secondary glaucoma due to fibrinous exudates 4%, iridocyclitis 1%, and adherent leukoma 7%, were as 58% had less significant vision-



Graph-1: Age group



Graph-2: Distribution of patient according to occupation



Graph-3: Microbial keratitis

threatening such as corneal scar away from visual axis, mild iridocyclitis, and mild raised intraocular pressure (IOP) which was controlled on topical anti-glaucoma medication.

DISCUSSION

In this disease we primarily evaluated the etiology of corneal ulcers and also tried to assess various determinants affecting the outcome of the disease. Diseases of the cornea are a major cause of blindness worldwide. Keratitis is a type of corneal inflammation resulting in vision loss. It typically arises due to noninfectious causes such as eye trauma but can manifest as a result of microbial infection by pathogens such as fungi, bacteria, viruses or amoebae. Until now, infectious keratitis remains one of the main causes of corneal blindness and poses a diagnostic dilemma due to its varied presentation and visual morbidity.

Majority of patients of infectious keratitis in this study were in between 46 and 60 (45%) age group followed by 31-45 (18%). Agriculture outdoor workers and farmers were the leading occupation factor of corneal ulcer in developing countries.⁷ This is in concurrence with that of Panda et al. Khare et al, Srinivasan et al and other studies shows similar results.^{8,9,10} Incidence was higher in males (59%) than that of females in our study. Male predominance was found in many studies, some has found it in the ratio as high as 1.6.^{11,12} This may be because males are more involved in outdoor activities and also males are preferred over females to seek medical advice.

Our study showed farmers (47%) and Industrial workers (27%) was the predominant occupation having corneal ulcer. Srinivasan et al showed that the majority of corneal ulcers were observed in the farmer.¹⁰ Very similar to the study by Nath R et al here also vegetative trauma was the most common factor for the corneal ulcer representing 49% cases.¹³ Bharathi et al and other author also found the ocular trauma as a main predisposing factor for microbial keratitis.^{13,14} Over 20% per cent of all patients with a vegetative trauma implicated wheat/maize, followed by tree branches and thorns, mud and vegetable matter. 3% patients had corneal ulcer due to injury with animal's tail. This was also supported by the fact that significantly higher number of patients presented during harvesting season. Study by Lin c c et al also found the seasonal variation in the presentation of corneal ulcer.¹⁵

Out of the 1013 patients with corneal ulcer, Fungal ulcer (42%) were more common in this study than bacterial (31%), which was similar to the findings of Basak et al.¹⁶ Very similar to other studies here also *Fusarium* spp., followed by *Aspergillus* spp., was the most commonly isolated fungal pathogen Srinivasan et al show the similar to the findings, while other studies have found *Aspergillus* spp most common.^{17,18} This may be due to differences in the geographical distribution and climatic considerations of the areas studied.

In this study, over 53% of patients presented within 7 days of symptoms and most of them had less severe sequelae of the disease. Late presenters had been treated elsewhere by local practitioners and many of them given steroid eye drops.¹¹ These were responsible for late presentation and severe vision threatening complications of the disease. So Lack of awareness and local treatment from non-ophthalmologist was contributing to severity of disease in our study. However, we could find few studies in this regard accepting the above facts. One study suggested 20.8% fungal corneal ulcer patients, being treated with steroid prescribed by local non-ophthalmologist and practitioners.¹⁹

42% of patients in our study had visual threatening complications, caused due to corneal perforations and melting (29%), followed by secondary glaucoma 4%, and adherent leukoma 7%. 58% patients had less significant vision-threatening such as corneal scar, mild iridocyclitis etc. which were treated with medications.

In our study, most of the patients had Best Corrected Visual

Acuity (BCVA) in Group E (52%) and Group D (27%). Over 77% patients in Group E and 55% patients in Group D had some improvement in BCVA post treatment. Similar results were noted in other studies. Also over 64% patient corneal ulcer healed after treatment and 8% patients did not responded to treatment and the condition worsened even after providing best possible treatment.

CONCLUSION

This study highlighted the fact that proper diagnosis and management of corneal ulcer is very much necessary among exposed population. Incidence of fungal corneal ulcer is very high among agriculture and industrial workers and lack of awareness and poor treatment leads to corneal blindness which could have been prevented by timely intervention. Community awareness of the risk factors, use of protective eye wear, masks and face shields and restriction of the abuse of topical corticosteroids plays a key role for control worsening of diseases.

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