Original Research Article

Clinical profile of infective keratitis at tertiary eye care hospital Warangal, Telangana

K.B. Chandrabhanu[1], R. Ashok[2*], K. Haridev Kumar[3]

[1,2,3]Assistant Professor, Department of Ophthalmology, Kakatiya Medical College, Warangal, Telangana

[*]Corresponding author email: **ashokrama1962@gmail.com**

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Abstract

Introduction: Infective Keratitis is most common cause of corneal blindness in Rural India. Agricultural farmers are more at risk. Fungi and Bacteria are the main cause for this ocular ailment. Early diagnosis and treatment may prevent the corneal blindness.

Aim: To evaluate common etiological factors causing Infective Keratitis in the region of Northern Telangana.

Materials and Methods: This study was conducted at Tertiary Eye Care Hospital, Regional Eye Hospital, Warangal, Telangana State. Fifty patients were admitted with infective keratitis were clinically evaluated. Each case was analysed and results were recorded as per etiology, clinical symptoms and signs, complications and visual outcome.

Results: Age group greater than 40 years (58%) were more common with male predominance (54%) was observed. People living rural area (72%) were affected more than urban areas. Agricultural labour (52%) was mostly seen with infective keratitis. Most of the cases were with trauma (62%) with vegetative matter was mostly seen. Most of the cases were acute (78%) in origin. Fungi were most common organism isolated from the cultures. Staphylococcus and Streptococcus (62%) were common species isolated from bacterial origin and they were antibiotic sensitive (92%). Aspergillous was common fungus isolated Diffuse Corneal ulcer was most common complication. Malnutrition was main cause in systemic illness. Most of the patients before treatment were with no passage of light after treatment visual acuity has prognosis to 6/18 vision.

Conclusion: Early diagnosis and treatment may improve the visual prognosis and prevent Corneal blindness due to Infective Keratitis.

Key words

Infective keratitis, Corneal blindness, Bacteria, Virus, Parasites.

Introduction

In India, corneal blindness accounts around 6.8 million people suffering with vision less than 20/200 in at least one eye and of these, almost a million have bilateral corneal blindness [1]. In year 2006- 2007 national survey was conducted by the government of India who found that in our country 0.90% of total blindness is as a result of corneal lesion. It is also expected that by 2020 this number of corneal blind people in India will esculate 10.6 million [2]. All over the world, bacterial keratitis is the preeminent cause of keratitis followed by fungal keratitis but vice versa occurs in case of India and other tropical countries. Moreover, in developing countries bacteria has been replaced by fungus as the paramount cause of infectious keratitis.

Infective Keratitis is the most common cause of corneal blindness in Rural India. Low socioeconomic status, Lack of health awareness, Poor Sanitation and Agricultural labour related injuries are the main predisposing factors for this ocular ailment. Early diagnosis and proper management may give good visual prognosis. To create awareness, to improve the living standards, to increase the accessibility of Eye Care facilities may prevent the corneal blindness due to Infectious Keratitis [3].

Fungi and Bacterial microorganisms are the most common etiological agents causing Infectious Keratitis. Most common causative agents are Fungi like Aspergillous, Fusarium Candida is most commonly seen in Diabetic and Immunocompromised. Bacteria causing infective keratitis are Staphylococcus, Streptococcus, Pneumococcus. Viral causing are H. Simplex, H. Zoster.

The purpose of this study was to know the common etiological agent and Clinical manifestations which were useful in the meticulous management of infective keratitis.

Materials and methods

This prospective observational study was being conducted at Regional Eye Hospital, Warangal, Telangana State. It is a Government Tertiary Eye Care Hospital for the region of Northern Telangana. Two hundred cases were admitted in Department of Ophthalmology with infective keratitis during the period of 2016 to 2017 June only 50 cases were selected based on inclusion criteria in study.

All the cases were admitted in the hospital. For each case a detail and relevant clinical history was recorded. Cases were thoroughly examined by means of (with the help of) Visual Acuity chart, Slit lamp biomicroscopy, fluorescence staining and Ophthalmoscope. Conjunctival swabs and corneal scrapping were sent for microbiological examinations like KOH mounting, Gram staining and Culture and Antibiotic sensitivity. Blood samples sent for Blood sugar, CBP, ESR, HIV, etc.

All the patients presenting to us with chief complaints of pain, redness, watering, photophobia and who were stain positive were taken into account. Ulceration was defined as a loss of corneal epithelium with underlying stromal infiltration and suppuration associated with signs of inflammation with or without hypopyon. Ulcers with typical features of healing ulcer, interstitial keratitis, sterile neurotropic ulcers, and any other ulcers associated with autoimmune conditions were excluded.

At presentation, information pertaining to demog raphic features, duration of symptoms, risk factor s, and occupational status was documented for every suspected case of infectious keratitis. Each case was followed for 6 weeks to record the visual prognosis.

Cornea evaluation was carried out using a slit lamp, biomicroscope and findings were recorded. Detailed diagrammatic documentation of the ulcer was done and recorded on a daily basis. Associated ocular conditions were noted. After a detailed ocular examination, corneal scraping was performed under aseptic conditions from each ulcer using a sterile Bard-Parker blade. The procedure was performed under magnification of a slit lamp following instillation of preservative free 2% lignocaine hydrochloride. Material obtained from scraping of the bleeding edge and base of each ulcer was inoculated on relevant media and sent for microb iological culture and sensitivity.

Laboratory procedure

For bacterial cultures, the materials were inoculated aerobically at 37˚C onto blood agar, chocolate agar, and potato dextrose agar (PDA). Cultures on blood agar and chocolate agar was evaluated at 24 hours and 48 hours, and then discarded if there was no growth.

For fungal cultures, the materials were inoculated on to Sabouraud dextrose agar (SDA) and incubated at room temperature, examined daily, and discarded after two weeks if there was no growth. Bacterial cultures were considered positive only if growth of the same organism was demonstrated on both media or there was semi confluent growth at the site of inoculation on one media with identification of morphologic al characteristics of similar organism in Gram Stain. The specific identification of bacteri al pathogens was based on microscopic morphol ogy, staining characteristics, and biochemical pro perties using standard laboratory criteria.

Fungi were identified by their colony characteristics on SDA and by the morphological appearance of the spores in lactophenol cotton blue stain, and in some cases by slide culture method. If hyphae were observed in corneal smear by microscopy in KOH mount preparation, but failed to grow in culture, the causative organism was reported as fungal.

Treatment was started according to microbiological reports. If organism was detected (due to antimicrobial therapy received prior to presentation) treatment was started accor ding to clinical sign and symptoms. Complicated and Chronic cases were referred to higher centres for further management, like Keratoplasty.

Results

Middle aged i.e. >40 years (58%) age groups were more common. Male predominance (54%) was observed. People living rural area (72%) were affected more than urban areas. Agricultural labour (52%) was mostly seen with infective keratitis (**Table – 1**).

Table - 1: Demographic details in study.

Age group (Years)	**No. of cases**	**%**
1-10 years	3	6%
10-20 years	9	18%
20-40 years	12	24%
>40 years	26	58%
Gender		
Males	27	54%
Females	23	46%
Urban /Rural		
Urban	14	28%
Rural	36	72%
Occupation		
Agricultural labour	26	52%
Other labour	12	24%
Students	2	4%
Housewife	6	12%
Others	4	8%

Trauma (62%) was most common predisposing factor in study. Injury with vegetative matter was mostly seen. Most of the cases were acute (78%) in origin (**Table – 2**). Fungi were most common organism isolated from the cultures (**Figure – 1**). Staphylococcus and Streptococcus (62%) were common species isolated from bacterial origin and they were antibiotic sensitive (92%) (**Table – 3**).

Table - 2: Predisposing factors, Mode of trauma and duration of injury in study.

Predisposing factors	**No. of cases**	**%**
Trauma	31	62%
Lacrimal disease	4	8%
Lid disease	2	4%
Others	13	26%
Mode of trauma		
Injury with vegetative matter like Paddy, thorn, Stick, etc.	28	56%
Dust, Sand, Stone, Metallic foreign bodies.	8	16%
Other injuries (Sharp objects, Nail prick, chemical injuries, Cracker injuries)	14	28%
Duration		
Acute	39	78%
Chronic	11	22%

Table - 3: Bacterial Culture/ Smear Staining, Culture and Antibiotic Sensitivity.

Bacterial Culture/ Smear Staining and Culture	**No. of cases**	**%**
Staphylococcus and Streptococcus	31	62%
Pseudomonas	2	4%
Pneumococcus	6	12%
Others (E.coli, Klebsiella, etc.)	11	22%
Antibiotic Sensitivity		
Sensitive	46	92%
Resistant	4	8%

Aspergillous was common fungus isolated (**Figure – 2**). Diffuse Corneal ulcer was most common complication in study. Malnutrition was main cause in systemic illness (**Table – 4**). Most of the patients before treatment were with no passage of light after treatment visual acuity has prognosis to 6/18 vision (**Table – 5**).

Discussion

Infective keratitis is the most common cause of corneal blindness in India. It is a preventable and treatable blindness in India. In this study we noticed the most common predisposing factors contributing to this disease are Poverty, illeteracy, poor personal hygiene and sanitation and Agricultural labour (52%) related ocular injuries. Males (54%) are more commonly affected than females. As Males more commonly come across Occupational injuries which are in agreement with the male preponderance in the elderly reported in another study [4]. In this study we observed that the Fungi is the most common microorganism causing Corneal ulcer mainly in Agricultural workers with paddy injuries. Aspergillous is the most common fungi which accounts 78%.

Table - 4: Corneal ulcer with Complications and systemic illness in study.

Corneal ulcer with Complications	**No. of cases**	**%**
Diffuse Corneal ulcer	12	24%
Impending corneal perforation	7	14%
Perforated corneal ulcer with pseudocornea	5	10%
Associated with Secondary Glaucoma	23	46%
Endophthalmitis	2	4%
Panophthalmitis	1	2%
Systemic illness		
DM	9	18%
HIV	1	2%
Malnutrition	21	42%
Syphilis	16	32%
Hansen disease	3	6%

Table - 5: Visual Acuity before and after in study.

Visual Acuity (VA**) at the time of reporting**:	**No. of cases**	**%**
NOPL to PL +	3	6%
HM –CF5mts	9	18%
6/60—6/18	26	52%
Better than 6/18	11	22%
Visual Prognosis		
Better than 6/18	31	62%
6/24 to 6/60	12	24%
CF 5mts to PL+	4	8%
NO PL	3	6%

NOPL-No light

Figure - 1: Etiological agents (Microbiological Profile).

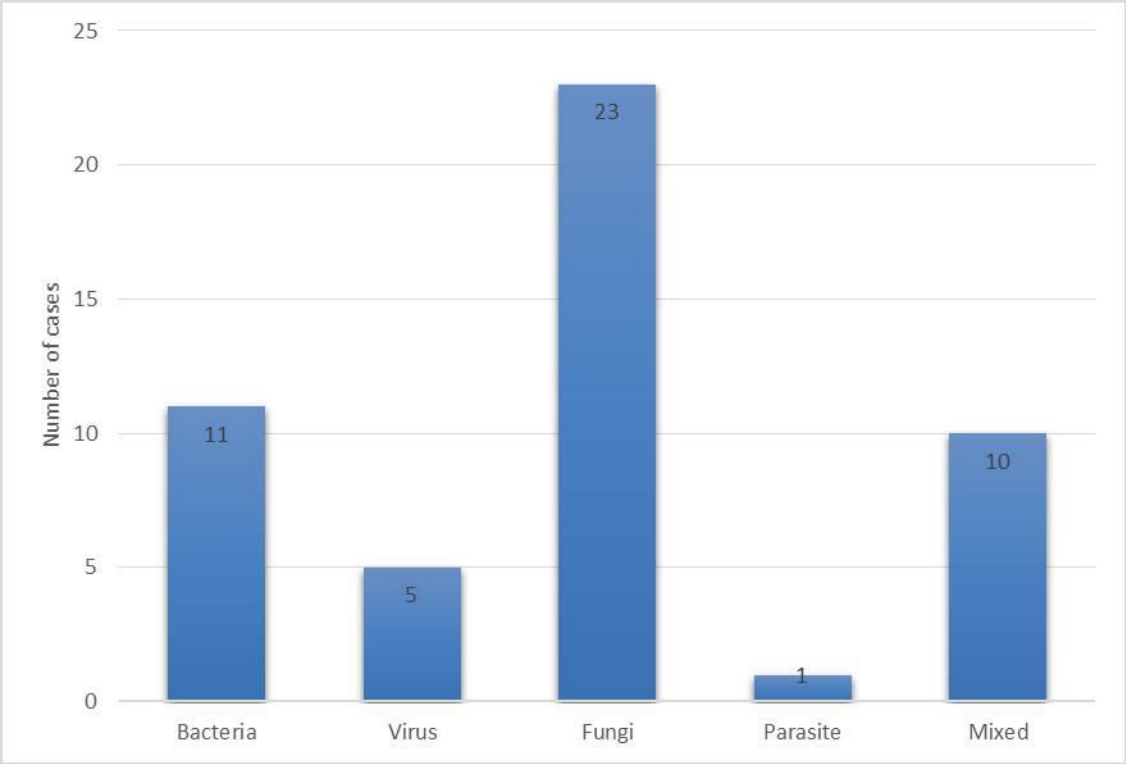
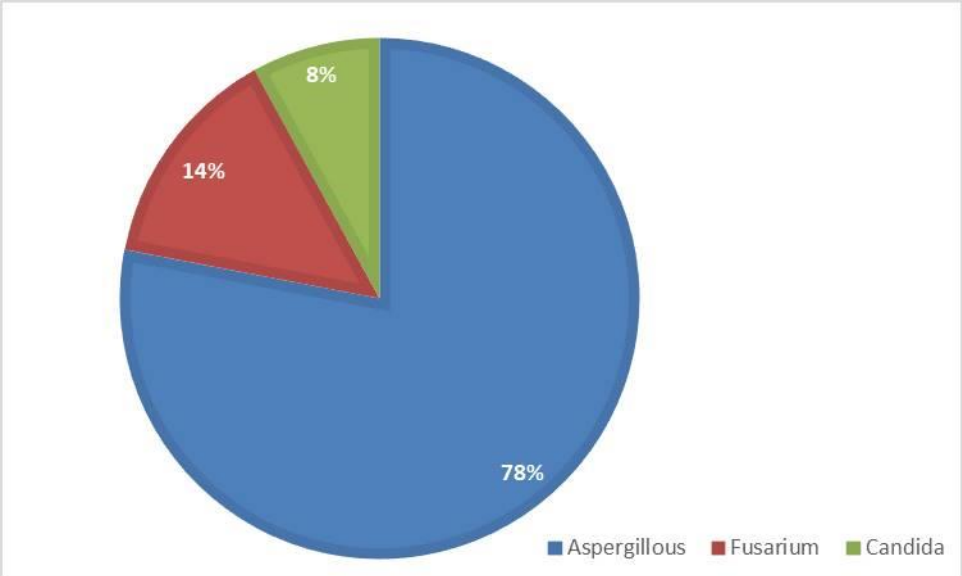


Figure - 2: Fungal Culture and Staining.



In our study, history of usage of traditional medicine was present in 2 cases. Of the non-traumatic risk factors associated with development of corneal ulceration are chronic dacrocystitis accounts for 8%. Other studies [2], noted chronic dacryocystitis, mucocoele and lagophthalmos as predisposing factors. Other predisposing factors noted were ectropion, Bell's palsy with exposure keratitis, corneal anaesthesia following herpes simplex or herpes zoster infections, neurotrophic keratitis.

Regarding morphological features of ulcers central corneal ulcers were most commonly associated with fungal ulcer in which hyphate margins are seen. Most common Fungal isolate are in our study Aspergillus spp. (78%) and Fusarium spp. (14%). They were followed by

candida. Aspergillus spp. was most predominant in fungal corneal ulcer as shown by other studies in the Indian subcontinent 61.53% in Manglore by Sanjeev, et al., (2012) [5], 41.18% in Chandigarh by Jagdish Chander [6].

Unlike our study Fusarium spp. have been reported as the major causative agent of fungal corneal ulcer in Vishakapatnum by Sirisha, et al. (2015) [7] who reported that out of 52 fungal cornel ulcer patients, 19 (36.54%) were positive for Fusarium spp. Amrutha Kumari, et al. (2014) [8] in Karnataka also stated Fusarium (61.91%) as the most common fungi isolated from corneal ulcer.

The most common bacteria isolated in our study was Staphylococcus aureus i.e. 62% followed by 4% Pseudomonas spp., Pneumococcus species 12% followed by other Klebsiella spp 22%. Our study is in accordance with the studies done by Swati Gupta [9] study showed Staphylococcus aureus i.e. 16 (57.3%) followed by 9 (32.2%) Pseudomonas spp., 2 (7%) CONS and 1 (3.5%) Klebsiella spp. Suryawanshi Gaurav, et al. (2013) [10] who isolated 12 (38.7%) Staphylococcus aureus as most common pathogenic bacteria followed by 8 (25.8%) Streptococcus pneumoniae, 6 (19.35%) Pseudomonas spp. Filamentous fungi are the major fungal pathogens in fungal corneal ulcer. Yeast like fungi have low preponderance in fungal corneal ulcer. Sirisha, et al. (2015) [6] in 2015 who concluded that fungal corneal ulcer (49%) is more common than bacterial corneal ulcer (21%), Suryawanshi Gaurav, et al. (2013) [10] in Maharastra found that out of 62 cases of corneal ulcer 22 (35.48%) were having fungi as causative agent, 20 (32.25%) were having bacteria as causative agent and 11 (17.74%) were having mixed growth.

As per our study fungi is more predominant causative agent of keratitis than bacteria. Hence it should be kept in mind before treating the patient that to find an appropriate causative organism we should always go for KOH mount, Gram stain and culture so that an appropriate treatment can be prescribed, as it is a preventable cause of blindness affecting large number of people worldwide. Flouroquinolones appear to be the therapy of choice for bacterial keratitis and Natamycin for filamentous fungi. These findings are much useful in prevention and treatment of corneal ulceration in our country [11, 12].

Though the current investigation was limited by small sample size, it makes several significant contributions to current literature. We believe that this study provides updated data of infectious keratitis in a rural area of Telangna, and can be informative particularly regarding infectious keratitis in rural areas. Further studies including larger population are needed for more generalized data.

Conclusion

Improvement of living conditions, early diagnosis and treatment may improve visual prognosis and prevent corneal blindness due to infective keratitis. Knowledge of local prevalence of etiological agents of infective keratitis and their susceptibility patterns helps in guiding ophthalmologists to select appropriate antibiotic for empirical therapy.

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