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Ophthalmology

INFECTIVE KERATITIS - PROFILE AT AN TERTIARY CARE EYE INSTITUTE

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KEYWORDS :

INTRODUCTION

Infective keratitis in one of the important causes of preventable blindness. Younger individuals are more affected as they are more involved in day to day activities like agriculture, most of the patients are come from rural areas. Corneal blindness due to infective keratitis in very common as timely appropriate treatment cannot be given due to lack of availability of ophthalmologist and diagnostic facilities[1,2,3,4,5,6].

AIMS AND OBJECTIVES

1. To analyses the distribution of cases with infective keratitis.
2. He causative factors like traumatic agents, time of presentation, symptom duration and factors predisposing to perfection
3. To estimate fungal, bacterial and other infective cases of infective keratitis

MATERIAL AND METHODS

This was an epidemiological cross-sectional observation study at tertiary care eye institute, Sarojini Devi Eye Hospital / Osmania Medical College, Hyderabad the period of study from November-2018 to March-2020.

A total number of 150 patients were examined with detailed history, local examination, systemic examination for any existing co-morbidities. The age, Sex

Etiology of keratitis noted based on relevant microbiological investigations.

METHODOLOGY

- **Study setting:** Department of Cornea and Trauma, Sarojini Devi Eye Hospital, Hyderabad, Telangana
- **Study duration:** Twelve months (2018 November to March - 2020).
- **Study design:** Cross sectional observational prospective study.
- **Sample size and sampling method:** 150 patients who fulfilled the inclusion criteria were included in the study by random sampling method.
- **Study subjects:** Patients with infective keratitis who presented to Department of Cornea and Trauma at the institute were included in the study.
- **Inclusion criteria:** patients with infective keratitis who gave consent were included in the study.
- **Exclusion Criteria:** patients who did not consent to the study were excluded; patients with the following conditions were not included in the study:
- Healing ulcers
- Mooren's ulcer
- Interstitial keratitis
- Any ulcer associated with autoimmune disease
- Neurotrophic ulcers

RESULTS

150 patients were examined and investigated for the case of infective with investigations like corneal scrapings and culture.

A total of 150 patients who met the inclusion criteria were studied.

Gender distribution:

Of all 150 patients, 110 were males and 40 were females with an overall ratio of male to female patients of 2.9:1.

Distribution of patients according to gender (N=150)

Gender	Number of patients	Percentage
Males	110	73.33
Females	40	26.66

Age distribution

The predominance of corneal ulceration in males was most pronounced in fifth and sixth decades of life with mean (± standard deviation) age of 46.4 (±16.32) years

Distribution of patients according to acie (N=150)

Age group (years)	Number of patients	Percentage
1-20	10	6.6
21-40	50	33.33
41-60	60	40
61-80	30	20
Total	150	99.99

Age and Gender distribution

Most of the patients were males between third and seventh decade of life. Distribution of patients according to age and gender (N=150)

Age group	Gender		Total no. (%)
	Male no. (%)	Female no. (%)	
1-20	6 (5.40)	4 (10.25)	10
21-40	40 (36.30)	10(25.64)	50
41-60	44 (39.63)	16 (41.02)	60
61-80	21 (18.91)	9 (23.07)	30
Total	**111**	**39**	**150**

Demographic distribution of patients (N=125)

Most of the patients (64, 8%) were from rural areas

Demography	Number of patients	Percentage
Rural	99	66
Urban	51	34
Total	**150**	**100**

Distribution of patients according to type of work (N=15Q)

Type of work	Number of patients	Percentage
Farmers or Agriculture	61	40.66
Auto or cab drivers	15	10
Students	9	6
Laborer	25	16.66
Stone mason	5	3.33
House wife or domestic workers	15	10
Tradesman or professionals	9	6
Unemployed	11	7.33
Total	**150**	**99.98**

Distribution of patients according to eve affected (N=150)

Right eye was affected in 81 (54%) patients and left eye was affected in 69 (46%) patients.

Eye affected	Number of patients	Percentage
Right eye	81	54
Left eye	69	46
Total	**150**	**100**

Duration of symptoms prior to presentation at the institute

About 34% of the patients presented to the institute with a week of onset of symptoms

Distribution of patients according to duration of symptoms prior to presentation aL the institute (N=15Q)

Duration of symptoms	Number of patients	Percentage
1-7 days	51	34
8-14 days	33	22
15-21 days	38	25.33
22-29 days	12	8
>1 month	16	10.66
Total	**150**	**100**

Presenting complaints

Majority (92%) of the patients complained of watering, redness and foreign body sensation. The next common complaint was decreased vision in affected eye (69.6%),

Distribution of patients according to symptoms (N=150)

Symptoms	Number of patients	Percentage
Decreased vision	92	61.33
Pain	73	48.66
Watering	32	21.33
Photophobia	36	24
Redness	118	78.66
Watering	122	81.33
Foreign body sensation	118	78.66

Traumatic agents

Of the 125 patients, 102 (83.2%) patients gave history of trauma to affected eye. Of them, majority (36.8%) sustained trauma with organic/ plant matter.

Distribution of patients according to traumatic agents (N=150)

Traumatic agents	Number of patients	Percentage
Organic/ plant matter (wood/ grass/ paddy/ vegetable matter)	57	38
Animal matter (bull tail/ cow tail/ insect)	11	7.33
Finger nail	11	7.33
Dust/ mud/ stone/ sand	27	18
Cricket ball	4	2.66
Metal particle	6	4
Unknown chemical	5	3.33
Unknown foreign body	8	5.33

Prior medication

Medical help was sought by 89 (71.2%) patients. They were seen by eye physicians or general physicians or pharmacists. Of them 5 (4%) patients went to village healers and were given herbal medicine to be instilled in the eye. 34 (27.2%) patients were using antibiotic eye drops like ciprofloxacin, gentamycin or moxifloxacin; 13 (10.4%) patients were started on both antibiotics and antifungal eye drops. 36 (28.8%) patients did not have a record of eye drops they were using.

Distribution of patients according to medication used prior to presentation to the Institute (N=125)

Type of medication used	Number of patients	Percentage
Antibiotic eye drops (ciprofloxacin, gentamycin, moxifloxacin)	41	27.2
Both antibiotic and antifungal eye drops	15	10.4
Anti-viral eye ointment (acyclovir)	8	5.6
Unknown eye drops	36	24
Herbal medicine	6	4
None	44	28.8
Total	150	100

Systemic illness

Systemic illness of prior diabetes mellitus and hypertension were noted. Ofthe 150 patients, 6 (4%) patients gave history of diabetes and 5 (3.33%) gave history of hypertension. 4 out of 6 diabetic patients had uncontrolled blood sugar levels. Another 5 (3.33%) patients had high blood pressure; 3 (2%) had high random blood sugar values and 3 (2%) patients had high blood pressure and random blood sugar values when investigated in the institute.

Distribution of patients according to type of systemic illness (N=150)

Systemic illness	Number of patients	Percentage
Diabetes mellitus (type II)	6	4
Hypertension	5	3.33
Denovo diabetes mellitus	3	2
Denovo hypertension	5	3.33
Denovo diabetes and HTN	3	2
No known systemic illness	128	85.33
Total	150	99.99

Microbiological profile

Of the 150 cases, bacterial and fungal cases were identified based on culture results and viral keratitis cases were diagnosed based on symptoms and signs.

Thus, of 150 cases, 126 (84%) cases were culture positive. Among the 126 culture positive cases, 76 (50.66%) cases were fungal positive and 50 (33.34%) were bacterial culture positive.

Of the 76 fungal culture positive cases, corneal scraping in 54 (71.43%) cases showed KOH positive and KOH was negative in 22 (28.57%) cases.

12 (8%) patients were diagnosed as having viral keratitis based on the presentation. Viral keratitis cases were identified by vesicular lesions on face and lids in Herpes Zoster and by punctuate keratitis in herpes simplex. 12 (8%) cases were culture negative.

Distribution of patients according to microbiological profile

Diagnosis		Number of cases	Percentage
Culture positive	76 Fungal	76	50.66
	BaS Octerial	50	33.34
Culture negative		12	8
Viral keratitis		12	8
Total		150	100

DISCUSSION

Corneal ulcer is one of the predominant causes of blindness and ocular morbidity in developing countries, the incidence of corneal ulceration is higher in South India compare to data of other countries[7,8].

Gender distribution

Male preponderance (74%) of patient in our study were males similar to studies conducted in Madurai, West Bengal and Warangal[9]. In our study male to female ratio was (2.84:1). In comparison to the above three studies. Our study has similar results to the study compared by Usha Gopinathan et al (2.25:1)[12].

Age distribution

In our study the risk of infection was more in males who were in 5th to 6th decade of life or 44% as compared to the other studies done by Madhurai and Warangal. Outdoor activities and frequent exposure to the risk factors like trauma during agriculture activity may be the reason.

Demography

Most of the patients (66%) were from rural background it was similar to study conducted in Warangal and West Bengal. In rural population Infection rate is high due to higher chance of injury and lack of awareness delay in consulting an ophthalmologist for treatment, use of herbal treatment and practice of removing foreign body with unsterile material.

Occupation

Most of the patients were farmers and agricultural workers (40.66%) the profile of occupation was shows similarities to other studies conducted in West Bengal, Warangal and Madhurai.

Duration of symptoms

Our study shows that (34%) of patients reported within a one week of onset of symptoms. Compared to West Bengal study only (11%) of patients came to the hospital within one week.

The reason may be unavailability of medical care in the nearby places and the awareness further treatment may be better, Madurai study shows that (60%) of the patients reported within one week and (75%) of patients reported within one week in Warangal study.

Presenting complaints

In our study (93%) of patients had complaints of redness, watering and foreign body sensation. Apart from these (62%) cases complaints of diminished vision.

Traumatic agents

In our study (86%) most of the traumatic agents was organic or plant matter which is common in rural population as most of them are agriculture workers by occupation.

Others injury with finger nail, dust, stone, cricket ball were very few. Corneal trauma is the history of injury within one week was similar to other studies conducted in Madhurai and West Bengal, these studies. Agricultural workers are usually more prone to injury with organic or plant matter. Other traumatic agents noted were finger nail, dust stone or sand, cricket ball, were very few. Corneal trauma with history of injury within one week was similar to other studies conducted in Madhurai and West Bengal.

Study	Total number of trauma cases	Trauma with organic or plant matter
Present study	86%	74%
M Srinivasan et al[10]	65.4%	59.2%
Samar K Basak et al[11]	82.9%	59.6%
K. Ravinder et al[7]	46.25%	-

Prior medication:

107 patients (71.33%) visited other local practioner before coming to this institute. This was similar to the studies conducted in Madhurai (71.4%) and West Bengal (88.1%).

Patients who came to our institute were on topical antibiotics 41(29.24%) 15 (10.7%) were using' both antibiotics and anti-fungal drugs 8 (5.70%) were on antiviral treatment and 36 (28.68%) could not give details of the medication they were using. It was observed that most of the patients used medication without doctors consultation or used medication given by village healer. In our country medicines are sold without prescription. Some of the patients are also used herbal medicines[13,14,15,16,17].

So the above mention reasons may have devastating effects on the treatment of infective keratitis.

Showing comparison of use of prior medication in various studies

	Present study	M Srinivasan et al [10]	Samar K Basak et al[11]	Usha Gopinathan et al[12]
Number (n) of patients using prior medication (%) 150	106 (70.66)	376 (86.6)	1056 (88.1)	1945 (54.6)
Topical antibiotics (%of n) 41	38.30%	57.7%	86.9%	
Topical antifungals or both (% of n) 15	14.15%	9.8%	18.4%	
Antiviral eye ointment (% of n) 8	7.54%		12.8%	
Herbal medicine (% of n) 6	4.0%	37.3%		0.4%
Unknown (% of n)44	29.33%	-	3.2%	

In all the studies topical antibiotic eye drops were commonly used medication followed by topical antifungal eye drops. In Madurai, herbal medicine was also commonly used.

Systemic illness

It was observed that the patients who were come to our institute had Diabetes mellitus and hypertension. 6 (4%) patients had diabetes mellitus, hypertension 5 (3.33%). These patients referred to other institutes for treatment of diabetes mellitus and hypertension[18,19,20,21,22].

This was almost similar to study conducted in Madhurai and West Bengal.

Showing comparison of percentage of culture positive cases in various studies

Study	Percentage of Culture positive cases
Present study	84%
M Srinivasan et al[10]	68.4%
K. Ravinder et al[7]	56.94%
Samar K Basak et al[11]	67.7%
Usha Gopinathan et al[12]	92.5%
Derek Y Kunimoto et al[23]	72.5%

Showing comparison of percentage of isolateS-Ln culture positive cases in various studies

Study	%of Culture positive cases	%Of Fungal positive cases	%of Bacterial positive cases	% of Mixed cases	% Of Acanthamoeba cases
Present study	84%	60.31%	39.68%		-
M Srinivasan et al[10]	68.4%	32.0%	32.3%	3.4%	-
K. Ravinder et al[7]	56.94%	29.16%	27.77%	-	-
Samar K Basak et al[11]	67.7%	42.5%	15.3%	9.5%	-
Usha Gopinathan et al[12]	92.5%	38.2%	51.9%	7.5%	2.4%
Derek Y Kunimoto et al[23]	72.5%	18.63%	62.74%	-	0.98%
A K Leek et al[9]					
India	68.9%	38.6%	23.9%	5.5%	0.9%
Ghana	50.3%	36.2%	12.4%	1.4%	0.3%

In the present study most of the cases fungal, culture, positive cases. This study correlates with the study done in Ghana West Bengal and other Indian studies.

The weather conditions which are prevailing in our country like hot and humid climates. May be the reason for high incidence of infective keratitis.

CONCLUSION

- The age groups who get infective keratitis are usually in the 4th to 6th decade of life.
- These age group people are active and involved in agricultural activities
- Infective keratitis is commonly seen in rural areas compare to urban population
- We need to strengthen the treatment services like immediate accessibility of the patients to consultation with an ophthalmologist
- A lot of input has to be given to rural population with regard to primary eye care services
- Our study shows that most of the infections are fungal and bacterial
- We need to strengthen the diagnostic modalities to be available keeping inview rural population
- In we strengthen the above systems that is diagnosis and treatment will be as early as possible and visual rehabilitation should be better

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