

TO STUDY THE CAUSATIVE ORGANISM RESPONSIBLE FOR CORNEAL ULCER IN S.S.G HOSPITAL VADODARA, GUJARAT

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ABSTRACT

Introduction: Number of blind people in the world is 45 million. Out of which 5.4 million blind people are in our country. Corneal ulcer is a major cause of blindness throughout the world. About 10% cases of blindness are due to corneal ulcer.

Aims: To detect bacteria or fungus causing corneal ulcers and to give rapid presumptive diagnosis from direct smear examination.

Study Design: 150 samples were collected during period of 1 year from clinically diagnosed cases of corneal ulcer at SSG Hospital, Baroda. The patients were of both sex and age groups varying from 2 to 70 years, outpatient department as well as indoor patients

Study Period: one and half years

Results: A total number of 150 patients presenting with suppurative keratitis were enrolled in the study from Ophthalmology department, SSG Hospital & Medical College, Baroda. Of the total 150 patients 99 (66%) were males & 51 (44%) were females with ulceration occurs in both group most frequently in the middle decades of life.

Keywords: Corneal ulcer, suppurative keratitis, ophthalmology

INTRODUCTION

Number of blind people in the world is 45 million. Out of which 5.4 million blind people are in our country. Corneal ulcer is a major cause of blindness throughout the world. About 10% cases of blindness are due to corneal ulcer.^{1,2}

Corneal ulcers can be caused by exogenous infections i.e. by viruses, bacteria, fungi or parasites and sometimes it is allergic in nature or it can be due to endogenous infections.³

The frequency of fungal keratitis has increased over the past 20 to 30 years^{3,6} especially with the advent of corticosteroid therapy, when

improperly initiated. The steroids allow the fungi to prosper and gain a more substantial foothold in the cornea^{6, 7, 8}. Secondary fungal keratitis occurs in immunocompetent persons. It has been realized that a significant percentage of suppurative keratitis is caused by fungi.¹

Progress of human beings occurs in every field as they pass on their heritage from one generation to another. Generation dies but its knowledge is passed on to the next generation which after confirming the old facts and adding its own experiences in turn passes all these to the next generation.

The term keratitis had been introduced by "James Wardop" in 1869 in his essay on morbid anatomy of human eye.¹¹

Corneal ulcer due to Pneumococci was first established by "Gasparriini" (1883), Uthoff (1895) and Axenfield (1896)^{12, 13}. Different types of Pneumococci were isolated from corneal ulcer-type IV 75%, type III 25%, by Cheney (1922) type I, II and IV by Wright (1927) and type IV by Schmeltzer (1935).¹⁴

Pseudomonas pyocyanea corneal ulcer was first reported in the literature by Herrnhaiser (1893) and Bietti (1899). *Pseudomonas* produced perforation and loss of eye of 23 cases reported in the literature in 1936.^{15,16} *Moraxella lacunata* Corneal ulcer was described by Petil (in 1899) and *Morax Axenfeld* (1896).¹⁷ Corneal ulcer due to anaerobic clostridium was first described by Pringle (1919). The corneal ulcer due to Tubercle bacilli was described by Roy and Alvarez (1885) and Panas and Vassaux (1885).¹⁹

Bacterial corneal ulcer

McNabb (1927) reported Pneumococci in 16 (64%), Staphylococci in 5 (20%), Streptococci in 1(4%), Diplococci in one (4%) and no organisms in two cases.²⁰ Thygeson (1948) reported Pneumococci in 70% and gram negative bacilli in 18% of cases in his study.²¹ *Pseudomonas* is also important causative organism for corneal ulcer. Cassady (1959) in the study of 50 cases, he had stressed the importance of *Pseudomonas pyocyanea* in corneal ulcer. He found

Pseudomonas pyocyanea in 9 cases, Staphylococci in 4 cases, *Haemophilus influenzae* in 1 case, Streptococci in 2 cases, Diphtheroid in 2 cases, *Diplobacillus pneumoniae* in 1 case, *Klebsiella pneumoniae* in 1 case, coagulase negative. Staphylococci in 13 cases and no organisms isolated in 17 cases. He found *Pseudomonas* was highly sensitive to polymyxin-B.²

MATERIAL AND METHODS

150 samples were collected during period of 1 year from clinically diagnosed cases of corneal ulcer at SSG Hospital, Baroda. The patients were of both sex and age groups varying from 2 to 70 years, outpatient department as well as indoor patients.

The Pretested Performa of the present study was used. Microbiological Investigations were done by using following test, gram stain, KOH preparation, aerobic culture and antibiotic sensitivity.

OBSERVATIONS AND DISCUSSION

Maximum cases of bacterial ulcers occurred in the age group of 31 to 60 years. Thus 32 (71.11%) patients were in the age group between 31 to 60 years. Out of total 45 bacterial ulcers 25 (55.56%) were seen in male and 20(44.44%) were seen in female.

Table 1: Distribution of Isolates according Age and Sex

Age (yrs.)	Bacterial isolates			Fungal isolates			Negative		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
0-10	1	0	1	0	0	0	1	0	1
11-20	0	0	0	0	0	0	1	0	1
21-30	3	4	7	2	1	3	3	2	5
31-40	10	6	16	5	4	9	16	8	24
41-50	4	1	5	7	1	8	10	5	15
51-60	7	4	11	5	2	7	14	5	19
61-70	0	5	5	3	2	5	6	2	8
71-80	0	0	0	0	0	0	3	0	3
81-90	0	0	0	0	0	0	0	0	0
Total	25	20	45	22	10	32	54	22	76

The maximum cases of mycotic ulcers also occurred in the age group between 31 to 60 yrs. Out of 32 cases 22 (68.75%) male and 10 (31.25%) were females. Relationship between Predisposing factors corneal ulcer shown in Table - 2.

Most of the patients suffering from Bacterial corneal Ulcer were presented with History of Predisposing factors like conjunctivitis (35.56%) fall of foreign body (17.78%), Vegetative Injury (8.89%), Ocular Surgery (8.89%). While in case of Mycotic Keratitis the major risk factors were

vegetative injury (56.25%), Conjunctivitis (18.75%), and Blunt trauma (12.50%).

Table 2: Predisposing factors for Keratitis

Predisposing factors	Isolates		Culture Negative
	Bacterial	Fungus	
Ocular Trauma			
Vegetative Injury	4	18	15
Foreign Body & Sand dust	8	1	6
Blunt trauma	0	4	5
Co-existing ocular diseases			
Conjunctivitis	16	6	16
Trachoma	3	0	4
Dacryocystitis	3	0	2
Systemic diseases			
Diabetes	3	0	3
TB	0	0	1
Leprosy	0	0	3
Post Operative	4	2	7
Contact Lens	0	0	1
Unknown	4	1	13
Total	45	32	76

Table 3: Distribution of cases by causative organism

	Bacteria	Fungal
Positive direct smear	28 (62.22%)	23 (71.87%)
Positive culture	45	32

Bacteria were isolated from 45 cases. Out of which 28 (62.22%) were positive by direct smear examination.

Fungus was isolated from 32 cases. Out of which 23 (71.87%) were positive by direct smear examination. In our study Gram positive bacteria were isolated from 34 cases (75.56%), while Gram negative bacteria were isolated from 11 cases (24.44%) Bacterial is

Table 4: Distribution of cases by different types of bacteria

Organisms	No. of Isolates (%)
Staph aureus	20 (44.44)
Coagulase Negative Staphylococcus	7 (15.15)
Pneumococci	5 (11.11)
Streptococci	2 (4.44)
Pseudomonas spp.	9 (20.0)
Proteus	1 (2.22)
Klebsiella	1 (2.22)
Total	45 (100)

CONCLUSIONS & RECOMMENDATIONS

Out of 150 cases of corneal ulcers, bacteria were isolated from 45 cases and fungus from 32 cases. The highest incidence of corneal ulcers is among 31 to 61 years of age. In both, bacterial as well as fungal ulcers males (66%) affected more than females (34%). Out of 45 bacterial ulcers, 27 were positive by direct smear examination by gram stain, and out of 32 mycotic ulcers 21 were positive by 10% KOH preparation. Regular screening for fungal infection of farmers, people in rural areas and diabetic patients. Regular microbiological screening of patients who have h/o of eye injury to detect etiological agents.

REFERENCES

1. Present status of National Programme for control of Blindness, 1992, Page No. 1-6, By Ophthalmology section, Directorate General of Health Services, Ministry of Health and Family Welfare, New Delhi
2. John P. Whitcher, M. Srinivasan & Madan P. Upadhyay. Corneal blindness a global perspective. Bull WHO, 2001; 79(3): 214-221
3. Grayson's Diseases of the cornea by Robert C. Arffa M.D., 3rd edition. Published by Mosby Year Book, 163.
4. H. N. Madhavan: External Ocular infection. Indian Journal of Medical Microbiology, 1996; 14 (3): 133-144.
5. Vinay Agrawal, Jyotirmay Biswas, H. N. Madhavan, Gurmeet Mangat, Madhukar K. Reddy, Jagjit S. Saini, Savitri Sharma, M. Srinivasan. Current Perspectives in Infectious Keratitis. Indian Journal of Ophthalmology, 1994; 42: 171-191
6. Jones DB. Diagnosis and management of Fungal Keratitis. In: In Tasman W, Jaeger EA, eds. Duane's Clinical Ophthalmology. Philadelphia : JB Lippincott, 1998; CD-ROM edition

7. Gibert Smoline: The Cornea, 3rd edition, 1994. Published by Little Brown and Company : 118-124
8. Chester W. Emmons, Medical Mycology, 3rd edition. Published by Henry Kempton Publishers, London: 485.
9. V. M. Mahajan: Acute bacterial infections of the eye. British Journal of Ophthalmology. 1983; 67: 191-194.
10. B. Khanal, M. Deb., A. Panda, Harinder Singh Sethi. Laboratory Diagnosis in Ulcerative Keratitis. Journal for Research in Experimental and Clinical Ophthalmology; 2005; 37 (3): 123-127.
11. James Wardop: "Anatomy of human eye". From Medical Mycology by Chester W. Emmons, 2nd Edition.
12. Duke Elder Sir Stewart: "System of Ophthalmology" Vol. VIII, Part II, 1965, Page No. 763. Quoted by 21.
13. Uthoff and axenfield: Arch, Oph. 1897, 44: 172. Quoted by 28.
14. Mary K. Johnson et al. "Ocular toxin of the pneumococci". Am. J. Ophthalmol. 1971; 72, (1): 175-180.
15. Parson's Disease of eye. 5th edition, 1969.
16. Gifford's Textbook of Ophthalmology, 6th edition, 1958, Published by W.B. Saunders Company.
17. Petit P. "Sur une forme particuliere d' infection corneenne a erpigneux". Ann. Ocul. 1899, 121: 166.
18. C. H. Greer: Ocular pathology. 2nd Edition. 1972, Published by Blackwell Scientific Publications.
19. Daniel Vanghan: General Ophthalmology 3rd edition, 1962. Published by Lange Medical Publications.
20. McNabb, A Trana. "Bacterial corneal ulcers". Ophthalmic. Soc. U.K. 1927; 37:57.
21. Thygeson P.: "Diseases of outer eye" Quoted from "System of Ophthalmic by Duke Elder, Vol. III, Part II, Page 786, Published by Henry Kempton, London.