Infectious Keratitis in Present Scenario

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Abstract: ***The purpose of the study is to have an overview of infectious keratitis in relation to its etiopathogenesis and visual recovery. The present study was conducted in 150 cases during the academic session 2010-2013. The patient were analyzed in accordance with demographic profile, predisposing factor, microbiological status of patient in reference to 10% KOH, gram's stain , culture sensitivity and treatment advised in accordance with the diagnosis of the patient. Result- During analysis following data were deduced, 78%, 54%, 14% and 5% had bacterial, fungal, viral and mixed flora respectively It was noted that patients involved in agriculture activity or those suffering from trauma inflicted with vegetative material had more risk of developing microbial keratitis that is 66% .Overall culture was positive in 18% of bacterial and mixed infection whereas only 9% of fungal keratitis clinically diagnosed, had culture positivity, whereas viral keratitis was diagnosed clinically only, who showed adequate responses to antiviral treatment. In bacterial keratitis surgical intervention was required in 11.53%, BCL in 14.4%, Perforation occurs in 28.8%, whereas it healed in 89.41% and conjunctival hooding in 5.7%. In fungal keratitis 41.65%, 20.7%, 62.4% and 54.16% respectively and in viral keratitis 16.66% require surgery, 83.32% healed, BCL in 16.66%, 33% pthisical in viral. Conclusion – Study shows bacterial keratitis is more common than fungal & viral with male predominance in younger age .trauma by vegetative material or injury is most common risk factor, final diagnosis based on risk factor, clinical feature, response to treatment .Viral keratitis diagnosed clinically. Bacterial keratitis has better prognosis than fungal and viral.***

Keywords: microbial keratitis , microbiological sensitivity pattern and treatment outcome

1. Introduction

Microbial keratitis is one of the leading cause of avoidable blindness in developing nations [1, 3, 5]. Surveys in many parts of worlds have revealed that corneal scarring is an important cause of blindness and visual impairment (upadhyaya et al 1991; shrinivasan et al 1997; norina et al 2008; whitcher et al 1997; chirambo et al 1986) [16,18] blindness survey in Nepal (brilliant et al,1985)too showed that corneal trauma and ulceration are second leading cause of unilateral blindness after cataract and are responsible for 11.85% of all blindness [2,11,17].

The incidence of microbial keratitis varies from place to place from USA has an incidence of 11 per 100,000 persons for microbial keratitis as compared to 799 per 100,000 persons in Nepal (upadhyaya et al 2001) [2, 17] epidemiological features and causative organisms for keratitis varies from region to region within the same country [4, 6, 8, 9]. The clinical diagnosis of microbial keratitis often relies on a thourugh specific history of infectious exposure , epiological treands and morphological feature(upadhyaya et al 2001).furthermore , the course of the disease and patient management is directly affected by the lack of proper diagnosis and initiation of appropiate antimicrobial treatment [3,10,11,13]. To begin the proper management required quick and accurate identification of causative microorganisms. Therefore, the evaluation of the etiological diagnosis region wise and sensitivity pattern of isolated microorganisms provide the valuable information for initiation of their management.[8]For this, some studies in Indian subcontinent have provided the important data so this study was conducted in conducted in Upgraded Department of Ophthalomology, N.S.C.B. medical college and hospital, Jabalpur (M.P.).

Most of the studies about microbialkeratitis haveprimarily evaluated epidemiological features, predisposing. Factors and clinical features of corneal ulceration (Whitcher et al, 1997; Srinivasan et al, 1997; Norina et al, 2008; Upadhyaya et al, 1991; Williams et al, 1987), but this study, along with the epidemiological pattern and identification of causative microorganisms, tried to include the sensitivity pattern of bacterial isolates, treatment modalities and their outcome. (Dhakhwa *et al Nepal 2012 ;)* [14, 15.12, 18, 19]

2. Materials and Methods

The present study was conducted in 100 cases in Upgraded Department of Ophthalmology, N.S.C.B. medical college and hospital , Jabalpur (M.P.) from 2010 to 2013 were included in the study.. the patient were analyzed in accordance with demographic profile, predisposing factor, microbiological status of patient in reference to 10% KOH, gram's stain , culture sensitivity and treatment advised in accordance with the diagnosis of the patient. Patients were seen consecutively after the initial clinical diagnosis of corneal ulceration was made. Ulceration was defined as a loss of the corneal epithelium with underlying stromal infiltration and suppuration associated with signs of inflammation with or without hypopyon. Typical healing ulcers were excluded, as were Mooren's ulcers, marginal keratitis, interstitial keratitis, sterile neuro-trophic ulcers and any Ulcers associated with autoimmune conditions.

2.1 Statistics

All case report forms were checked for completeness and inappropriate or illogical responses. The forms were entered using Microsoft 2007 Excel worksheet. The databases were validated and all inconsistencies and differences were resolved. Statistical analyses were performed using STATA 12 for Windows (StataCorp LP, Texas, USA). Categorical data are presented as frequency counts (percent) and compared using the chi-square or Fisher's exact statistic as appropriate. Odds Ratio and 95% Confidence Intervals were also presented for 2 x 2 contingency tables. The significance level was considered Alpha =0.05 and at 95% confidence level.

2.2 Clinical Procedure

Every patient was examined on the slit-lamp biomicroscope. The size of the epithelial defect after staining with fluorescein was measured with the variable slit on the slit-lamp and recorded in millimeters on a standardized form. The presence or absence of a hypopyon was recorded; and the height of the hypopyon was measured in millimeters. Associated ocular conditions such as blepharitis, dacryocystitis, dry eyes, corneal anesthesia, lagophthalmos, any surgery on the cornea, use of contact lens, or ocular leprosy were noted. The use of topical medication including topical corticosteroids was also noted. After a detailed ocular examination, corneal scrapings were performed under aseptic conditions on each ulcer by ophthalmologist using a flame sterilized Kimura spatula. Scrapings were performed in the slit lamp after instillation of 4 % lignocaine (lidocaine). Material was obtained from scraping, the leading edge and the base of each ulcer, was inoculated directly onto Blood agar, and Sabaraud-Dextrose agar (SDA). Material from the corneal scraping was also taken on two separate glass slides for smear: one for Gram stain and the other for microscopic examination in the clinic as a KOH wet mount. All KOH smears were then sent to the laboratory for confirmation.

2.3 Laboratory procedure

All bacterial cultures were incubated aerobically at 37 °C. Cultures on blood agar were evaluated at 24 hours and then discarded if there was no growth. Fungal cultures inoculated onto SDA were incubated at 27°C, examined daily, and discarded after 2 weeks if no growth was present in culture. Microbial cultures were considered positive only if growth of the same organism was demonstrated on two or more solid media; or there was semi confluent growth at the site of inoculation on one solid medium associated with the identification of the organism of appropriate morphology and staining characteristics on Gram stain or KOH mounted corneal smears. The specific identification of bacterial pathogens was based on microscopic morphology, staining characteristics, and biochemical properties using standard laboratory criteria. Fungi were identified by their colony characteristics on SDA. All culture positive samples were tested for their sensitivity pattern with commonly available/ used antimicrobials. Treatment decision was based on clinical judgment and response to empirical treatment. Culture & sensitivity pattern was taken into account after 48 hours when culture sensitivity report was available of bacterial growth.

3. Results

3.1 Prevelance of Keratitis

In this study out of 150 cases, 78% are bacterial keratitis, 54% are fungal, 13.5% viral and 4.5% are mixed (Fig.1).

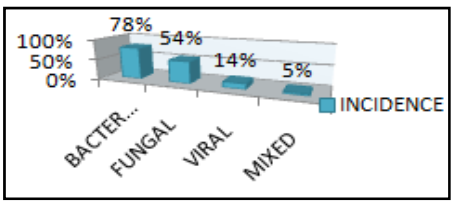

Figure 1: Prevalence of different types of keratitis in 150 cases

3.2 Epidemiological Characteristics

150 cases with the clinical diagnosis of corneal ulcers were enrolled in this study 89 cases were males and 61 were females. Ulceration occurred most frequently in the age group of 30-39 years in 58 cases, followed by 40 cases in the age group of less than 30 years. (Fig. 2).

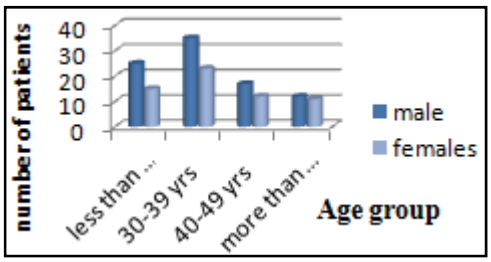

Figure 2: Age and sex distribution of 150 patients with corneal ulceration

4. Predisposing Factors / Risk Factors

Patients with history of trauma or injury by vegetative material are at more risk for development of corneal ulcer than other risk factors. (table.1).

Table 1: Predisposing Risk Factors for Microbial Keratits

	Risk factors	*% at*
1	Acute conjunctivitis	38
2	Trauma	66
3	Dacriocystitis	21
4	No past history	15
5	Undetermined	10
		150

4.1 Microbial Profile

Cultures were positive and fulfilled the criteria established for the presence of infection. During this study 18% cultures, exhibited pure bacterial growth, where as 5% cultures were of mixed type. Pure fungal growth was present in 9% of all cases of corneal ulcers (table. 2)

Table 2: Microbial growth pattern in 150 cases of corneal ulcers

S. No	*Culture*	*Organism*	*%*
1	Positive	Staph. Aureus	10%
2	Positive	Staph. Albus	8%
3	Positive	Staph. Aureus + coagulase +ve B. xerosis	2%
4	Positive	Staph. Aureus+coagulase+ vepneumococcai	3%
5	Positive	candida	6%
6	positive	aspergillus	3%
		Total	27%

5. Treatment outcome

This study included 150 cases of keratitis out of which In bacterial keratitis surgical intervention was required in 11.53%, BCL in 14.4%, Perforation occur in 28.8%, whereas it healed in 89.41% and conjunctival hooding in 5.7%. In fungal keratitis 41.65%, 20.7%, 62.4% and 54.16% respectively and in viral keratitis 16.66% require surgery, 83.32% healed, BCL in 16.66%, 33% pthisical in viral.

Table 3: Type of intervention (treatment given) and their outcome

Type of intervention	*Bacterial keratitis*	*Fungal keratitis*	*Viral keratitis*	*mixed*
Surgery	11.53%	41.65%	16.66%	-
Bandage contact lens	14.4%	20.7%	16.66%	-
Healed	89.14%	62.4%	83.32%	100%
Perforated	28.8%	54.16%	-	-
Conjunctival hooding	5.7%	-	-	-
pthisical	-	-	33%	-
TOTAL	100%	100%	100%	100%

6. Discussion

In many parts of the world, mainly in the developing countries, corneal ulceration is the major cause of blindness. As a result, corneal scarring is the second only to cataract as the most cause of visual disability in the world today (Whitcher et al 1997; Srinivasan et al 1997; Norina et al 2008; Upadhyaya et al 1991; Chirambo et al 1986; Brilliant LB et al, 1985).During analysis following data were deduced, 78%, 54%, 14% and 5% had bacterial, fungal, viral and mixed flora respectively It was noted that patients involved in agriculture activity or those suffering from trauma inflicted with vegetative material had more risk of developing microbial keratitis that is 66% .Overall culture was positive in 23% of bacterial and mixed infection whereas only 9% of fungal keratitis clinically diagnosed, had culture positivity, whereas viral keratitis was diagnosed clinically only, who showed adequate responses to antiviral treatment. In bacterial keratitis surgical intervention was required in 11.53%, BCL in 14.4%, Perforation occur in 28.8%, whereas it healed in 89.14% and conjunctival hooding in 5.7%. In fungal keratitis 41.65%, 20.7%, 62.4% and 54.16% respectively and in viral keratitis 16.66% require surgery, 83.32% healed, BCL in 16.66%, 33% pthisical in viral. Study shows bacterial keratitis is more common than fungal & viral with male predominance in younger age trauma by vegetative material or injury is most common risk factor, final diagnosis based on risk factor, clinical feature, response to treatment .Viral keratitis diagnosed clinically. Bacterial keratitis has better prognosis than fungal and viral.

7. Conclusion

Study shows bacterial keratitis is more common than fungal & viral with male predominance in younger age group as conjunctival cul-de-sac is very good medium for growth of numerous type of bacteria. The male predominance in account of than following basic outdoor activity profile and their livelihood, which also poses a visible threat to them as far as ocular disease, are concerned. Trauma by vegetative material or injury is most common risk factor, final diagnosis based on risk factor, clinical feature, and response to treatment .Viral keratitis is diagnosed on clinical sign and symptoms usually as they present with gamete of specific features acne to viral infection only. Bacterial keratitis has better prognosis than fungal and viral because bacterial keratitis are amenable to conventionally available antibacterial preparation.

8. Acknowledgement

We are extremely thankful to Dr. R.K.JAIN, head of department of microbiology, N.S.C.B. Medical College and hospital, Jabalpur (M.P) for his contribution to the microbiological study of the samples.

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