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CLINICAL PROFILE AND MANAGEMENT OF MYCOTIC CORNEAL ULCER IN A TERTIARY EYE CARE CENTRE OF COASTAL ODISHA

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ABSTRACT

Aim:- To find out clinical profile and management of mycotic corneal ulcer in patients attending eye department of a tertiary care hospital of coastal Odisha. **Materials and methods:-** This study was a prospective interventional study of 2 years duration (Oct 2015 to Sept 2017). 240 diagnosed fungal corneal ulcer cases with KOH mounting positive were included in this study. Detailed history taking and ocular examination was done. Samples were sent for identification of organism after corneal scrapping. Medical and surgical management was done according to severity. **Results:-** 240 cases were studied. Majority of cases were in working age group (21- 60 years). Male: female ratio was 2.6: 1. Agricultural workers were affected more (57.5%). 30% cases had history of trauma with vegetative matter. Central corneal ulcer was present in 55% cases. 50% cases has size < 20 sqmm. Aspergillus spp. was most common organism found (30%) followed by Fusarium (29.2%). Topical natamycin was the most common antifungal drop used. Ulcers with deep stromal and full thickness involvement were treated with systemic antifungals. Vision improved only in 12.5% cases. **Conclusion:-** Prompt diagnosis and treatment is important in cases of fungal corneal ulcer.

KEYWORDS : Fungal corneal ulcer, Aspergillus, Natamycin

INTRODUCTION:-

Corneal blindness is responsible for 1.5 to 2 million new cases of monocular blindness every year in which ocular trauma and corneal ulceration are significant contributors.[1] In a vast agricultural country like India, large number of laborers are mostly of low socioeconomic strata and are more exposed to trivial corneal injuries while working in the fields. The reported incidence of corneal ulceration in India is 1130 per million population.[2] Corneal infections of fungal etiology are common in India. Aspergillus (16–53%) and Fusarium (10–45%) are the common incriminating pathogens.[3] Ocular morbidity in fungal infections tends to be greater than that in bacterial keratitis. Polymicrobial infection and prior treatment with variety of medications, sometimes indigenous medicine add to difficulty in diagnosis. So it is necessary to be aware of the history of treatment and drug abuse of clinical presentation of fungal corneal ulcer. The aims of this clinical study are as follows: mode of presentation, evaluate the possible risk factors, investigations regarding the type of fungus and the statistics regarding the common type of fungi that involve the cornea for better treatment, various type of clinical presentation, prognosis with regard to the available mode of therapy and their results.

MATERIALS AND METHODS:-

This is a prospective intervention study of 2 years duration (October 2015 to September 2017) done at dept of Ophthalmology of a tertiary care hospital of coastal Odisha. Corneal ulcer patients diagnosed to be fungal corneal ulcer and KOH mounting positive were recruited for the study. 240 cases of diagnosed fungal corneal ulcer patients were selected for the study.

Inclusion Criteria:-

1. All corneal ulcer patients with positive 10% KOH preparation and/or positive fungal culture results.

Exclusion Criteria:

1. Ulcer with picture of viral origin
2. Ulcer from which scraping cannot be taken in impending perforation
3. Patients not given consent for the study
4. Patients lost follow up for 6 weeks

Each patient was subjected to a detailed history taking followed by detailed ocular examination. Patients were advised to get admitted to the hospital for observation and better follow up. If not they were advised to attend follow up in OPD without fail. Examination of anterior segment and corneal ulcer was done in detail with the help of a slit lamp biomicroscope. Recording of visual acuity using Snellen's chart was done. Fundus Examination wherever possible was done with indirect ophthalmoscope. Lacrimal sac syringing was done to rule out blockage in lacrimal drainage system. Fluorescein staining was done to assess the size of corneal ulcer. Routine laboratory investigations like complete hemogram, RBS, Urine - sugar, microscopy and albumin, HIV, HBsAg was performed in all patients. The sample for microbiological investigations was obtained by corneal scraping. The cornea was anaesthetized using 0.5% proparacaine solution and scraping was done using sterile No. 15 Bard Parker blade from the margin and base of the corneal ulcer. Gram's stain, 10% KOH preparation was done immediately. Bacterial culture using blood agar and chocolate agar was done. Sensitivity was checked using disc diffusion method if organisms were isolated. Fungal culture was done using Saboraud's dextrose agar medium.

Medical management was started immediately after obtaining the reports of positive 10% KOH preparation. Topical antifungal drugs like natamycin 5% eye suspension, fluconazole 0.3% eye drops were used hourly for the first 48 hours and then decreased to 2 hourly. If the smear showed pseudohyphae then fluconazole eye drops was also added. Topical therapy was continued at least 3 hourly for atleast 2 weeks after healing of the ulcer. Atropine 1% eye drops was used initially 8 hourly, Antiglaucoma medications like topical timolol maleate 0.5% eye drops and acetazolamide 250 mg tablets were prescribed wherever necessary. In all cases topical

antibacterial drops like moxifloxacin 0.3% was used on the basis of Gram's stain report. Systemic antifungal therapy was used in corneal ulcers with very large ulcer, deep stromal involvement, ulcers extending to the limbus or any evidence of anterior chamber involvement. Fluconazole 200 mg tablets were given twice a day for atleast a period of 15 days. Before starting systemic fluconazole liver function tests were done.

SURGICAL MANAGEMENT:

1. **Debridement of the ulcer:** This procedure was performed under topical anesthesia on a slit lamp using Bard Parker blade No. 15 or a spatula. It is performed in 24 to 48 hours. This was done daily to help better penetration of drugs until the ulcer showed decrease in infiltration.
2. **Conjunctival Flap:** The technique used was Gunderson's total conjunctival flap. It was done in one case of non healing ulcer with small perforation.
3. **Therapeutic penetrating keratoplasty:** It was done in case nonhealing ulcer after adequate medical therapy for a period of four weeks. Along with the surgical mode of treatment the necessary antifungal, antiglaucoma and cycloplegics were continued. The patients were examined on day 1, 2, 3, followed by first, second, third, fourth, fifth and sixth week. At each follow up ulcer details and visual acuity was recorded.

RESULTS:-

A total number of 77,370 patients attended the ophthalmology outpatients department at a tertiary care center of coastal Odisha between October2015 to September 2017. The total number of corneal ulcer cases were 710 out of which 240 cases were KOH positive.

Table no 1: Age distribution of patients

Age (Yrs)	No. of Cases	Percentage
<20	12	5
21-40	84	35
41-60	126	52.5
>60	18	7.5
Total	240	100

Majority of patients were in the age group of working population i.e., from 21 -60 years. Males (72.5%) were affected more than females (27.5%). Agricultural workers (57.5%) were affected more commonly.

Table no 2: Prior treatment at presentation

Treatment	No. of cases	Percentage
Antibiotics	132	55
Antibiotics + Steroids	28	11.7
Antibiotics + Antifungal	12	5
Steroids	10	4.1
Indigenous medicines	18	7.5
No History of medication	40	16.7
Total	240	100

The majority of patients 72 (30%) had trauma with vegetative matter, while 66 patients (27.5 %) gave history of fall of stone into the eye. 82.5% cases presented to the OPD within 15 days of injury. In 132 (55 %) cases corneal ulcers were located centrally, in 72 (30%) were located paracentrally and in 36 (15 %) were peripheral in location. 50% of the ulcers have size <20 sq. mm, 32.5% have 41-60 sq. mm, 7.5 % have 21-40 sq. mm and 10 % have 61-80 sq. mm. In 40% of the patients full thickness of the cornea, in 35% anterior stroma and 25 % patients mid stroma were involved.

Table no. 3: Fungal culture results

Organisms isolated	No. of cases	Percentage
Aspergillus spp.	72	30
Fusarium	70	29.2
Candida	8	3.3
Curvularia	4	1.7
No growth	86	35.8
Total	240	100

Table no- 4: Topical treatment combinations used

Drugs	No. of cases	Percentage
Natamycin, Fluconazole Moxifloxacin	42	17.5
Natamycin	132	55
Natamycin, Moxifloxacin	36	15
Natamycin, Voriconazole, Moxifloxacin	6	2.5
Total	240	100

78 (32.5%) patients were put on systemic fluconazole 200mg tablets for atleast a period of 2 weeks. 6 patients (2.5%) were put on oral itraconazole 200mg BD tablets and 6 patients were treated with oral terbinafine 250 mg tablets OD. In this study, only those ulcers with deep stromal or full thickness involvement were treated with systemic antifungals. Out of 90 patients who were treated with systemic antifungal drugs 36 cases (40%) healed whereas 54 cases (60%) had complications like perforation and increase in infiltrate size. In 90% of patients ulcer debridement was done. In 1 patient therapeutic penetrating keratoplasty was done and in 6 patients conjunctival flap were given. In 17 patients no surgical treatment was done.

65% of patients had visual acuity between PL, PR+ to 3/60 at presentation and at 6 weeks 52.5 % of patients had visual acuity in that range. Most of them had centrally located ulcer. Only 30 patients (12.5%) had improvement and moved to the 4/60 to 6/60 visual acuity group. 154 ulcers (64.2%) healed leading to corneal opacities(mostly macular and leucomatous), where as in 56 cases (23.3%) adherent leucoma, secondary glaucoma and complicated cataract developed. Out of 30 cases (12.5%), which did not respond to topical and systemic antifungal therapy, 26 (10.9%) developed corneal perforation and become phthisical, rest 4 eyes (1.7%) were eviscerated.

DISCUSSION:-

Reddy et al found 600 corneal ulcers (i.e. 0.79%) and 36 fungal corneal ulcers (i.e. 0.06%) in their 75,277 outpatient department attendance.[4] The incidence of corneal ulcer in this series is similar to Reddy et al. In Nath et al study the commonest age group was between 41-50 years which was in agreement with the present study.[5] The higher incidence of keratomycosis detected in the male patients in the present study is in accordance with the observations of Zimmerman et al (76.1%), Reddy et al (52.2%), Dutta et al (59.3%) and Modan Mohan et al (78%).[4,6,7,8] The higher incidence in male is due to greater exposure to outdoor activities and prompt attendance of males in hospitals. In Bharathi et al study, farmers contributed to 64.75% of total fungal corneal ulcer patients.[9] In this study 5% of patients used steroid at presentation, which is in accordance with Bharati et al (7.85%) and Chowdhury et al (7.85%).[9,10] Corticosteroids have been proven to alter corneal metabolism, thereby changing the defense mechanism favoring growth of fungi and increase the virulence of pathogenic fungi. In Bharathi et al study 92.15% patients had corneal trauma and among them 61.28 % were by vegetative matter.[9] In this study maximum patients (30%) had history of trauma with vegetative matter. In Bharathi et al study, 46.66% patients reported within 7 days.9 In this study 82.5% cases presented to OPD within 15 days. Aspergillus was the most common organism found in this study which is in accordance with Basak et al and Chowdhary et al, whereas Bharati et al and Gopinath et al found Fusarium was the common organism.[9,10,11,12] In Loh RA et al study, natamycin was the most commonly (96%) used treatment for ulcers caused by filamentous fungi followed by amphotericin (75%) and voriconazole (63%).[13] In Chowdhary et al study, penetrating keratoplasty was done in 33% of patients and in Tanure et al study 25 % of patients underwent keratoplasty.[10,14] In this study only 1 case (0.42%) underwent keratoplasty. In Nath et al study, 69 (43.9%) cases healed with corneal opacity, 19 (12.1%) cases had perforation and 2 (1.3%) cases

developed endophthalmitis.[5] In this study 10.9% cases had perforation.

CONCLUSION:-

Prompt diagnoses and treatment is of paramount importance in cases of fungal corneal ulcer as it has a higher rate of morbidity. The basic diagnostic modalities are KOH mount, gram staining and Sabaraud's dextrose agar culture.

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Conflicts of interest:- There are no conflicts of interest.

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