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CLINICAL PROFILE WITH SEQUELAE OF EPIDEMIC KERATOCONJUNCTIVITIS IN A TERTIARY MEDICAL CENTER IN EASTERN INDIA

Ophthalmology

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ABSTRACT

Epidemic keratoconjunctivitis (EKC) is one of the commonest cause of red eye and is highly contagious. It occurs in outbreaks and involves primarily the conjunctiva but the cornea may be involved. It presents commonly as follicular conjunctivitis with superficial punctate keratitis and preauricular lymphadenopathy. Association of subepithelial infiltrates, pseudomembranes and symblepheron may occur. The current management depends on accurate diagnosis, cold compression, artificial tears, topical antibiotics, topical nonsteroidal anti-inflammatory drugs (NSAIDS) and judicious use of topical corticosteroids. The objective of this study is to describe 78 patients of an outbreak of EKC with membranous and cicatrizing sequelae and their response to the varied treatment.

KEYWORDS

Epidemic keratoconjunctivitis, Superficial punctate keratitis, True membranes, Corticosteroids

Introduction:

Adenoviral conjunctivitis is known to be the most common cause of red eye in the world, one of the most common type being epidemic keratoconjunctivitis (EKC). It occurs as epidemic outbreaks. It is common in crowded living conditions like schools, hostels and hospitals and transmitted by direct or indirect contact with ocular or respiratory secretions. Association of pseudomembranes and symblepharon with preauricular lymphadenopathy, follicular conjunctivitis and superficial punctate keratitis (SPK) has been documented in earlier literatures. A very few sporadic cases of true membranes associated with EKC has been reported. EKC treatment has consisted of cold compression, artificial tears, topical antibiotics, topical nonsteroidal anti-inflammatory drugs (NSAIDS) and topical corticosteroids.[1,2] This study is an effort to delve into the clinical profile of EKC with true membranes, their response to varied treatment regimen, the sequelae and resultant visual prognosis.

Materials and Methods:

This is a cross-sectional observational hospital based study approved by the Institutional Ethics Committee according to the tenets of the declaration of Helsinki. Our study included 78 patients in paediatric age group of 6-15 years who presented to us with red eye, discharge, membranes which bled on peeling and superficial punctate keratitis, associated with common cold and fever over a week in an outbreak of epidemic keratoconjunctivitis. All cases with papillae suggestive of allergic origin were excluded.

A thorough ocular, immunization and systemic history was taken and a comprehensive ocular examination consisting of best corrected vision and slit lamp examination was done. All patients diagnosed provisionally as viral conjunctivitis with true membranes were primarily treated with Moxifloxacin 0.5% eye drop 1 hourly, observed daily and clinical progression was noted. The membranes were peeled and sent for Gram's stain, Giemsa stain, culture and histopathology on day 1 and isolation was advised. With presence of lymphadenopathy, follicular conjunctivitis, superficial punctate keratitis and negative bacteriological investigations, a clinical impression of Viral Keratoconjunctivitis was inferred. Ganciclovir 0.15% gel five times a day along with lubricants in gel form in 2 hourly intervals was initiated on 3rd - 4th day and the clinical progression was noted on follow up. Subepithelial infiltrates and membranes were treated with Loteprednol low strength 0.2% eye drops on 3rd-7th day. Patching and generous lubricants were prescribed in case of development of large epithelial defect.

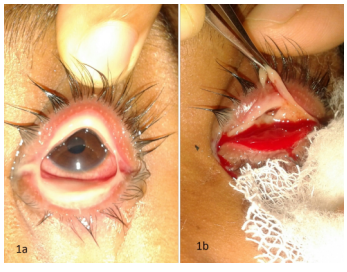
Laboratory investigations including Complete blood count, Erythrocyte Sedimentation rate, Mantoux, Chest X-ray, Fasting blood sugar and HIV ELISA (Human Immunodeficiency Virus Enzyme Linked ImmunoSorbent Assay) were sent to rule out superadded infection or any immunocompromised condition prior to initiating oral Prednisolone 1mg/kg in tapering dose along with proton pump inhibitors to reduce inflammation and membrane formation. Topical treatment was continued as before and followed daily.

Results:

The study includes 78 patients diagnosed as Epidemic Keratoconjunctivitis with true membranes with male: female ratio of 2:3 and more common in the 6-8yrs age group (71.79%).

All patients presented to the clinic with red eye with discharge, superficial punctate keratitis and membranes which bled on peeling along with fever and coryza.(Figure-1)

Figure 1: Thick membrane over palpebral conjunctiva(1a) with bleeding on peeling of membrane (1b)



Subepithelial infiltrates were observed within a week in 83.33% of patients. Almost 88% of patients had complete resolution with treatment by the end of 3 weeks. Few of the sequelae observed were large epithelial defect post topical steroid treatment, tylosis from severe conjunctival membranous inflammation and corneal opacity from healed subepithelial infiltrates. (Table 1)

Table 1: Presentation and Course of Disease (ORIGINAL)

Presentations	Day of presentation	Number	Percentage
Fever, coryza with severe conjunctivitis	Day1	78	100%
True Membrane	Day 1-5	78	100%
SPK *	Day 1-5	78	100%
Subepithelial infiltrates	Day 3-7	65	83.33%
Complete resolution	**Day 10-20**	**69**	**88.46%**
Large epithelial defect	Day after use of topical steroid	13	16.66%
Persistent SPK *	2-3 wks	9	11.53%
Corneal opacity	3-5wks	5	6.41%
Tylosis	3-5wks	9	11.53%

Note : *SPK = Superficial Punctate Keratitis

Only 14.11% of the patients had improvement in SPK with no effect on the membranes with topical antibiotics, antiviral and lubricants. Addition of topical low potency steroids to combat the subepithelial infiltrates and membranes resulted in exacerbation of SPK (83.33%) and development of large epithelial defect (16.66%) with only negligible effect on the subepithelial infiltrates (19.23%) and

membranes (2.56%).

Complete resolution of SPK, subepithelial infiltrates and membranes were seen in more than eighty percent of patients with withdrawal of topical steroids and treatment with Systemic Prednisolone in addition to topical antibiotic, antiviral and lubricant regimen.

Six percent of patients had vision threatening residual corneal opacity and 11.53% of patients had tylosis which required continued supportive treatment with lubricants. (Table 2)

Table 2: Clinical Outcomes in Response to Regimens through the Course of Disease (ORIGINAL)

Clinical Outcomes in response to regimen on follow up	Day 1-3: AB*+AV†+Lub‡	Day3-7 : AB*+AV†+Lub‡+Topical Steroid	Day 5-10: AB*+AV†+Lub‡+ Systemic Steroid. Withdrawal of topical steroid
Healing SPK§	11(14.11%)	-	69(88.46%)
Exacerbation of SPK§	67(85.89%)	65(83.33%)	9(11.53%)
Large epithelial defect	Not present	13(16.66%)	Resolved
Subepithelial infiltrate healing	Not present	15(19.23%)	65(83.33%)
Healing True Membranes	No change	2(2.56%)	69(88.46%)
Thickening of True Membranes	Not present	76(97.43%)	-
Tylosis	Not present	9(11.53%)	9(11.53%)
Corneal Opacity	Not present	5(6.41%)	5(6.41%)
Persistent SPK§	-	-	9(11.53%)

Note: *AB = Topical Antibiotic,
† AV = Topical Antiviral,
‡ Lub = Lubricant,
§SPK = Superficial punctate keratitis

Almost 66% of our patients had a final visual outcome more than 6/12 and the few with sequelae accounted for vision less than 6/60- to counting fingers resulting from the corneal opacity and persistent SPK.(Table 3)

Table 3 : Final Visual Outcome (ORIGINAL)

Age range	Visual Acuity				Total patients
	6/12-6/6	6/18-6/24	6/36-6/60	CF*-6/60	
6-8 years	38(48.71%)	11(14.10%)	4(5.12%)	3(3.84%)	56
9-12 years	9(11.53%)	2(2.56%)	1(1.28%)	1(1.28%)	13
13-15 years	5(6.41%)	2(2.56%)	-	2(2.56%)	9
Total	52(66.66%)	15(19.23%)	5(6.41%)	6(7.69%)	78

*CF = Counting fingers

Discussion:

Epidemic Keratoconjunctivitis is a serious ophthalmologic disease occurring sporadically in families, schools, health units and crowded areas. It is caused by Adenovirus serotypes 8, 19 and 37 and affects the conjunctiva and cornea. Most commonly presents with preauricular lymphadenopathy, follicular conjunctivitis and superficial punctate keratitis. Rare association of pseudomembranes and true membranes have been documented.[1]

There is no proven treatment for cure. The aim of the treatment should be directed towards alleviating the patient's symptoms, decreasing the course of the disease, decreasing the occurrence of membranes and subepithelial opacities. Antivirals had been documented to have no role in EKC in earlier studies. The treatment typically includes cool compresses, topical antibiotic, artificial tears, and in select cases, topical corticosteroids but recent studies have demonstrated evidence of efficacy of Ganciclovir 0.15% gel in treatment and more rapid improvement of symptoms of EKC.[3]

Despite supportive treatment, the intense conjunctival inflammatory response can lead to permanent symblepharon formation and dry eye. Multifocal subepithelial infiltrates (SEI) in cornea typically develop within 7 to 10 days after onset of the clinical signs of infection and can persist for months to years and lead to corneal opacity.[1] Topical steroids have been documented and established in management of subepithelial infiltrates and membranous conjunctivitis to prevent sequelae. But our patients had compromising exacerbation of corneal surface lesions and not much improvement of the infiltrates and membranes with topical steroids. This could be due to the enhanced adenoviral replication and delayed cell shedding from ocular surface, as studied previously.[2] The side effects weighing above the advantages put us in dilemma and we had to find an alternative to determine an effective regimen to prevent the ocular morbidity (e.g symblepheron, tylosis and corneal opacity).

Systemic corticosteroids have been established to be effective in preventing cicatrizing sequelae in Ocular mucous pemphigoid, Steven Johnson's Syndrome and other cicatrizing conjunctivitis by reducing the inflammation and fibrosis. Prednisone is usually given at a dose of 1–1.5 mg/kg/day , with appropriate monitoring for side effects. Therapy with prednisone lasts several months. Once patients achieve and maintain clinical remission, the steroid dose is decreased gradually. Generally, the adjuvant immunosuppressive drug is continued for approximately two years in ocular mucus pemphigoid.[4,5,6,7,8] On that basis we planned and initiated Systemic Corticosteroids. To the best of our knowledge, the use of oral corticosteroids in treatment of cicatrizing conjunctivitis of viral etiology has not been reported in any of the previous studies. A favorable visual outcome in 66.66% patients having a vision of more than 6/12 and only 7.69% having counting finger vision was achieved and they continued to be on monthly follow up for one year even after we tapered and stopped steroid treatment.

The small subject size, absence of control group, inability to perform polymerase chain reaction tests for adenovirus and inability to try steroid sparing treatment options like cyclosporine were many of the limitations in our study. The digital tonometry was normal in all patients on topical and systemic corticosteroid. Single use disposable devices like tonopen with covers were not available to us but would have been ideal.

Because the clinical symptoms add to patients' morbidity, control groups with placebo treatment was not feasible. Our study being just a cross sectional study we do not assert any of our treatments to be standard regimens.

We would like to conclude from our observations that one should chose a regimen targeting early control of inflammation to prevent sequelae and ocular morbidity, thus improving patients' quality of life.

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We certify that we have participated sufficiently in the intellectual content, conception and design of this work, as well as the writing of the manuscript, to take public responsibility for it and have agreed to have our name listed as a contributor.

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