

A Hospital Based Longitudinal Study on Outcome of Clinically Diagnosed Infective Conjunctivitis Attending Tertiary Care Center

Lipika Panda¹, Madhumita Rout²

¹Associate Professor, Department of Ophthalmology, Sri Venkateshwaraa Medical College Hospital & Research Centre, Ariyur, Puducherry, India.

²Consultant, Department of Ophthalmology, Kar Clinic & Hospital Private Limited, Bhubaneswar, Odisha, India.

Received: 17-12-2022 / Revised: 22-01-2023 / Accepted: 23-02-2023

Corresponding author: Dr. Lipika panda

Conflict of interest: Nil

Abstract

Background: Conjunctiva is a thin, translucent membrane lining the anterior part of the sclera and inside of the eyelid. It has two parts, bulbar and palpebral. Inflammation or infection of conjunctiva is known as conjunctivitis. Conjunctivitis can be classified into infective and non-infective types. Infective conjunctivitis include viral and bacterial conjunctivitis which are first and second most common cause of conjunctivitis respectively.

Aim: To study outcome of clinically diagnosed infective conjunctivitis during course of infection or during the convalescence period.

Materials and Methods: 180 consecutive patients with clinically diagnosed infective conjunctivitis attending OPD of tertiary care centre Bhubaneswar over a period of one year. They underwent slit lamp evaluation on every visit from the time of presentation till complete resolution of conjunctivitis. All of them were treated with 0.5% moxifloxacin eye drop and chloramphenicol & polymyxin-B sulphate eye ointment. Those who developed superficial punctate keratitis 0.5% loteprednol etabonate eye drop was used. Follow up regularly till resolution.

Statistical Analysis: Statistical analysis done by chi square test.

Results: Greater incidence seen among age groups 20-40 years. 12% of infective conjunctivitis of our study population involve cornea in the form of superficial punctate keratitis. 7% of the study population develop transient dry eye. 3% of infective conjunctivitis was associated with subconjunctival haemorrhage. Recurrence of superficial punctate keratitis found 1.1% of the study population. Time taken for resolution of conjunctivitis was prolonged when cornea involved compared to those who didn't have corneal involvement and was statistically significant.

Conclusion: Outcome of clinically diagnosed infective conjunctivitis are superficial punctate keratitis, subconjunctival haemorrhage, dry eye. Time of resolution was prolonged when conjunctivitis showed corneal involvement as sequel.

Keywords: Conjunctivitis, Superficial Punctate Keratitis, Viral, Bacteria, Outcome.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Conjunctiva is a thin, translucent membrane lining the anterior part of the sclera and inside of the eyelid. It has two parts, bulbar and palpebral. Inflammation or infection of conjunctiva is known as conjunctivitis. Conjunctivitis can be classified into infective and non-infective types. Infective conjunctivitis include viral and bacterial conjunctivitis which are first and second most common cause of conjunctivitis respectively. [1] The prevalence of conjunctivitis varies according to the underlying cause, which may be influenced by the patient's age, as well as the season of the year. Viral conjunctivitis is the most common cause of infectious conjunctivitis [2] Patients with viral conjunctivitis typically present with an acute red eye, watery discharge, conjunctival swelling, tender pre auricular node and some cases photophobia and foreign body sensation [3]. Bacterial conjunctivitis is the second most common cause and responsible for the majority of cases in children. [4] Matting and adherence of eyelids on waking, lack of itching and absence of a history of conjunctivitis are strongest factor associated with bacterial conjunctivitis. [1] Occasionally patients also have subconjunctival haemorrhage. Both the eyes may affected simultaneously or the second eye may become involved few days after the first eye. Some patients have an associated upper respiratory tract infection. [5,6] Virus causing viral conjunctivitis are adenovirus, herpes simplex virus, herpes zoster virus, pox virus, myxovirus picorna virus, arbovirus, ebola virus [7] The incidence of acute bacterial conjunctivitis range from 18.3% - 57% of all acute conjunctivitis in United states [8] Coagulase positive staphylococci are the commonest isolate in both acute and chronic conjunctivitis cases. *Klebsiella pneumoniae* emerged as the most common causative bacteria of conjunctivitis. [9] Most of the cases are diagnosed clinically

as microbiological study is time consuming.

Materials and Methods

The study was conducted in accordance with the Helsinki declaration of 1975 that was revised in 2000. Study was cleared by the institutional ethical committee. After obtaining informed consent, 180 patients were clinically diagnosed. infective conjunctivitis selected from patients attending OPD of department of Ophthalmology, HITECH medical college Hospital, Bhubaneswar for a period of one year.

A standard questionnaire was completed for each patient to evaluate the demographic factor, medical history, occupation and allergic history, characteristics of ocular complaints. All examinations were done by the same examiner. A complete external examination of each eye including lid, conjunctiva, cornea, done under slit lamp biomicroscopic. Examination of eyelid was done for evidence of oedema, mucous crust. Conjunctiva was examined for evidence of congestion, chemosis, petechial haemorrhage, membrane formation, papillae, follicle. Cornea was examined for any evidence of keratitis, ulceration etc. Application of fluorescein stain of cornea surface done to find any evidence of keratitis. Schirmer's test was done where needed.

All of them were treated with 0.5% moxifloxacin eye drop 6 times a day and chloramphenicol and polymyxin-B Sulphate eye ointment at bedtime for 7 days or till the patient is symptomatic (whichever is later). Follow-up done 1st week, 2nd week, 3rd week, 4th week. Those who developed keratitis 0.5% loteprednol etabonate eye drops 4 times a day and tapered over a period of 3 to 4 weeks. Those who developed dry eye

topical preservative free artificial eye drop were given.

Clinical Diagnostic Criteria

Patients with conjunctival congestion, chemosis, purulent/mucopurulent discharge, lid oedema, few cases with petechial haemorrhage, with or without preauricular lymphadenopathy.

Resolution of conjunctivitis was considered when conjunctiva becomes white and the eye is free from any discharge.

We defined recurrence as reappearance of corneal lesion after initial complete resolution.

Inclusion Criteria

All patients clinically diagnosed of infective conjunctivitis who have not started any medication prior to presentation satisfying the clinical diagnostic criteria in the age group 10 -70 years.

Exclusion Criteria: All patients who have started on any prior medication, allergic conjunctivitis, conjunctivitis due to other cause other than infective

Statistical Analysis

SPSS VERSION 21 was used for data analysis. Chi square test was used for comparison. Descriptive statistics mean and percentage were also used.

Results

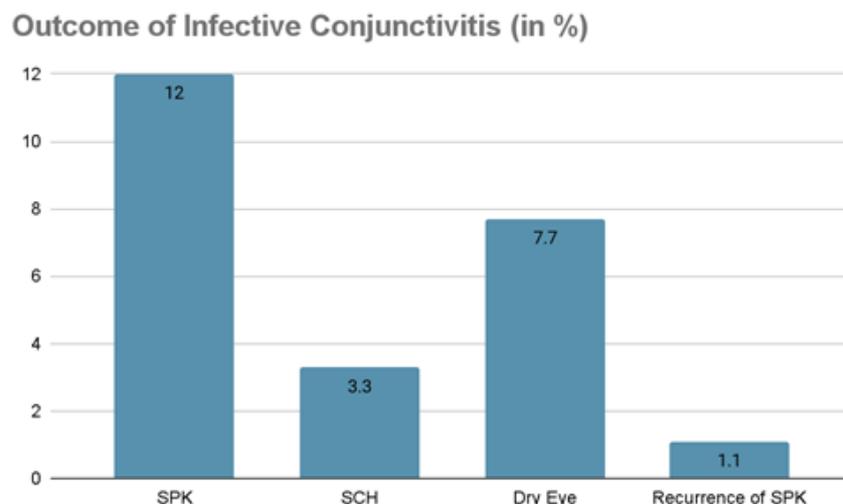
180 patients with clinically diagnosed infective conjunctivitis were analysed.

Table 1: Baseline Characteristics Variable

Age (Years)	Frequency (%) (n = 180)
<20	26 (14%)
21 - 30	41 (23%)
31 - 40	45 (25%)
41 - 50	38 (21%)
>50	30 (17%)
Gender	n = 180
Male	110 (61%)
Female	70 (39%)
Side	n = 180
Unilateral	22 (12%)
Bilateral	158 (88%)

In our study the highest incidence of infective conjunctivitis was seen in the age group of 31-40 years, i.e., 45%. The youngest patient was 5 days old and the oldest patient was 78 years old. A male preponderance was noted with 61%. Conjunctivitis usually affects both eyes,

either simultaneously or one after another. In our study both eyes affected 88%. The number of patients diagnosed with infective conjunctivitis was in the months of august, September, October. Least number of patients i.e., 0 in the month of April.

**Graph 1**

SPK - Superficial Punctate Keratitis
SCH - Subconjunctival Haemorrhage

All cases presented with conjunctival congestion, 70% had foreign body sensation, 60% had discharge (mucoid, mucopurulent, purulent), 20% had photophobia, 10% had defective vision. Membrane formation seen in 02 cases. Enlarged preauricular lymph nodes found in 19 cases. All patients had undergone slit lamp biomicroscopic examination and follow up done 1 week interval upto 4 weeks. In our study we found 12% of the study population had corneal involvement in the form of superficial punctate

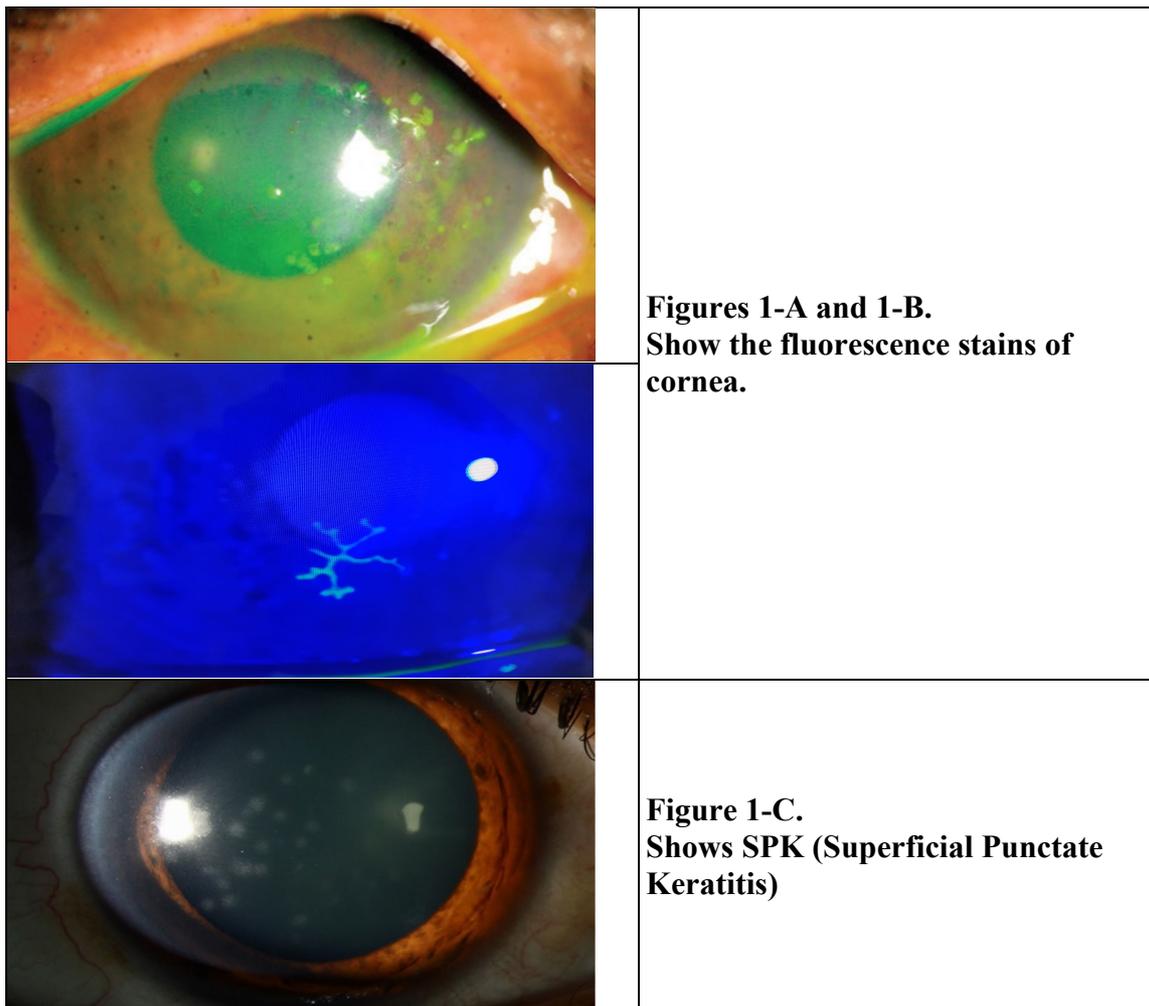
keratitis. Corneal involvement was found more in the age group of 31-40 years (31%). Corneal involvement was least among age groups < 20 years of age (9%). Subconjunctival haemorrhage was found in 3.3% of the study population. Subconjunctival haemorrhage resolves within two weeks. 7.7% of patients develop dry eyes, which persist for 3 weeks. Recurrence of superficial punctate keratitis found in two patients i.e., (1.1%) of study population.

Table 2: Time to Resolution of Conjunctivitis (Corneal Involvement vs No Corneal Involvement)

Time to Resolution (Week)	Corneal Involvement (%) (n = 22)	No Corneal Involvement (%) (n = 158)	p-value
1st	0	78 (49%)	<0.01
2nd	9 (41%)	80 (51%)	
3rd	11 (50%)	0	
4th	2 (9%)	0	

Maximum cases with corneal involvement in the form of superficial punctate keratitis were resolved within 3 weeks of treatment. Cases with no corneal involvement resolution were observed maximum within two weeks of treatment. There was a significant prognosis difference between cornea involvement and no corneal involvement cases with p value < 0.01, which is statistically significant.

Limitation of the study is that we have not done microbiological study of infective conjunctivitis.



Discussion

Generally infective conjunctivitis is self-limiting. A study from Karachi, Pakistan showed adenovirus 75%, bacteria 18.3%, 2-3% herpes simplex virus, 1.8% chlamydia trachomatis were causing infective conjunctivitis. [10] In our study we found involvement of cornea in the form of superficial punctate keratitis 12% of study population. After few days it leads to corneal subepithelial opacity. Keratoconjunctivitis caused by adenovirus serotype 8, 19, 37. Keratitis develops in about 30% of cases but is seldom severe [11] A study done at Tamil Nadu showed the corneal involvement as a sequel to infective conjunctivitis was seen only with viral infection. The time taken for resolution of viral conjunctivitis was prolonged when there was corneal involvement. [7] In our study

subconjunctival haemorrhages were found in 3.3% of the study population. A study done at Delhi showed that acute hemorrhagic conjunctivitis case isolated viruses were identified as either CoxS 24 or Enterovirus 70 using an indirect immunofluorescence assay. [12] In our study dry eye was detected in 7.7% of the study population. One study from China compared the results of the healthy eye. Most scores of BUT, S1T, TMH, FL were all abnormal until day 30 after recovery from acute conjunctivitis [13]. During acute conjunctivitis inflammation topical therapeutic agents can alter the tear film secretion resulting in dry eye for nearly 1 month in recovered eye [13]. So to prevent dry eye topical preservative free artificial tears used in the study population. Two patients (1.1%) from study population had recurrence of superficial punctate keratitis

A study from Bhubaneswar, India shows 4.8% recurrence of symptom found with microbiologically proven microsporidia keratoconjunctivitis [14]. The limitation in this study is that a microbiological study has not been conducted.

Conclusion

Infective conjunctivitis is mostly diagnosed clinically. The time of resolution and possible outcomes should be discussed with patients, so that they get an awareness about the condition. Early reports in case of development of such clinical situations can lead to good prognosis. Public awareness of infective conjunctivitis, its cause, and routes of spread should be sought.

References

1. Amir A AZAR, Neal P Barney, Conjunctivitis, A systematic review of diagnosis and treatment; JAMA, OCT 23, 2013; 310(16):1721-1729.
2. Stenson S, Newman R, Fedukovich. Laboratory studies in acute conjunctivitis. Arch ophthalmol.1982; 100(8): 1275-1277
3. Rietveld RP, Van Weert HC, Ter Riet G, Bindels PJ, Diagnostic impact of sign and symptom in acute infectious conjunctivitis; Systematic literature search. BMJ. 2003; 327 (7418); 789
4. American academy of ophthalmology. Cornea / external diseases panel. Preferred practice pattern guidelines; Conjunctivitis limited revision American Academy of ophthalmology; San Francisco, CA; 2011.
5. Yanoff J, Duker JS editors. Ophthalmology. Mosby. Spain. Disorder of conjunctiva and limbus; 2nd Ed. 2004; 397-412.
6. Morrow GL, Abbott RL. An Fam physician. 1998; 57(4); 735-746.
7. Manoj Vasudevan, G Premnath et al., A prospective observational study of the course of clinical infective conjunctivitis & analysis of the sequel of its corneal involvement; J of Evolution of Med and Dent Sci. 2014;3(58):131-135.
8. Smith AF, Waycaster C, Estimate of the direct and indirect annual cost of bacterial conjunctivitis in the United States, BMC Ophthalmol, 2009;9:13-20.
9. Veena CN et al. Bacteriological study of conjunctivitis, International Journal of Contemporary Medical Research. October 2016;3(10): 2829 -2832.
10. R M Woodland, S Darougar, U Thaker et al, Cause of conjunctivitis and keratoconjunctivitis in Karachi Pakistan, Transaction of the Royal Society of Tropical Medicine and Hygiene, May-June 1992; 86(3):317-320.
11. Kanski clinical ophthalmology a systematic approach ninth edition. 2022; 178.
12. Satapathy G, Mohanty S, Nayak N, An epidemic of viral acute hemorrhagic conjunctivitis in Delhi in 1994 Indian J Ophthalmol. 1996; 44;19-21.
13. Huang T, Wang Y, Liu Z, Wang T et al., Investigation of tear film change after recovery after acute conjunctivitis. Cornea. 2007 Aug; 26(7): 778-781
14. Sanchit Mitra, A. Mallick et al Squele of microsporidial keratoconjunctivitis and its management, Indian J Ophthalmol, 2021 June; 69(6): 1537-1543.