

Original research article

The pattern of presentation and determine the bacterial profile of conjunctivitis: an observational studyDr. Ranjeet Kumar¹, Dr. Gautam kumar²¹Senior Resident, Department of Ophthalmology, AIIMS Patna, Bihar, India²Senior Resident, Department of ophthalmology, Patna medical college and Hospital, Patna, Bihar, India

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Abstract

Background: Bacterial conjunctivitis is the second most common cause of infectious conjunctivitis. Majority cases of uncomplicated bacterial meningitis get resolved within 1 to 2 weeks. Almost all cases of bacterial conjunctivitis are self-limiting and do not cause any significant morbidity. This study was undertaken to study the pattern of presentation and determine the bacterial profile of conjunctivitis.

Materials and Methods: A prospective observational study was conducted in the Department of Ophthalmology, AIIMS Patna, Bihar, India for 1 year. This is prospective observational study with evaluation of demographic factors, associated comorbid conditions and finding causative organism i.e. bacteria gram staining culture methods and biochemical reaction.

Results: Out of 120 cases high number of cases of acute conjunctivitis was seen in the age group of 26–35. A male preponderance is noted with 75 males and 45 females. Total 80 patients were from low socioeconomic status and 40 cases were from middle socioeconomic status. All 120 patients underwent Gram stain and bacterial culture out of 120, 79 patients was culture positive and other was negative. The most common organism isolated Coagulase positive staphylococci 42.5% followed Klebsiella pneumoniae with 11.67%, Pseudomonas 5.83%, Haemophilus species 3.33% and Diptheroids 2.5%. Complications like Petechial haemorrhages were seen in 115(85.83 %) of the cases while Punctate keratitis was seen in 10(8.33%). All the cases presented with red eyes, conjunctival congestion is seen in all the cases, lid oedema in 106(88.33%) cases, matting of eyelashes in 51(42.5%) cases and preauricular lymphadenopathy in 55(45.83%) cases, Conjunctival follicles 98(81.67%) cases and Corneal sensation was present in 106(88.33%) cases.

Conclusion: we conclude, bacteriological evaluation of conjunctivitis provides to the ophthalmologist a working knowledge of the causal microbes, their common presentations, clinical course and antibiotic sensitivity patterns along with confirming the clinical diagnosis. It also helps to avert the use of inappropriate medications and reduce the risk of drug resistant strains. To achieve this end, public awareness particularly of conjunctivitis, its cause, routes of spread and medical management should be sought.

Keywords: Conjunctivitis, clinical presentation, risk factors, bacteria, microbiological profile, Gram stain

Introduction

Conjunctivitis refers to infection of the conjunctiva, which can be caused by a wide range of pathogens. After refractive errors, conjunctivitis is the second most common cause of people going to ophthalmology clinics.¹ Conjunctivitis is also the most common cause of redness of the eye, as the conjunctival tissue (the thin layer that covers the white of the eye) turns red in response to almost any stimuli.² Conjunctivitis accounts for 30% of eye complaints and

approximately 15% of people experience some form of this disease in their lifetime.³ In 78-80% of infectious conjunctivitis cases, infection is initiated by bacteria.⁴ Bacterial agents play a central role in the development of infectious conjunctivitis, especially in children.⁵ The major bacterial causes of conjunctivitis are *Staphylococcus*, *Streptococcus pneumoniae*, and *Haemophilus influenzae*.⁶ Bacterial conjunctivitis epidemics often occur in winter and early spring.³ If conjunctivitis is caused by viral or bacterial agents, the infection can become contagious. Accurate diagnosis of the type of infection and its etiologic factors and prescription of suitable antibiotics may shorten the duration of the disease as well as transmission time.⁶ Prevalence and etiology of acute bacterial conjunctivitis varies from place to place, even within the same country owing to geographical, cultural and socioeconomic variation.^{7,8} Till now no data is available regarding pattern of bacteriological flora of acute bacterial conjunctivitis in north-east Indian population. Studies evaluating association of different organisms and complications of acute bacterial conjunctivitis is not reported till date. The north-east Indian region needs a separate investigation as this area is very humid, rains heavily, its typical geographic location, wide temperature variation, predominance of low and middle socioeconomic class of people, ethnic and socio-cultural variation as compared to mainstream India. Again antibiotic sensitivity pattern of the organisms (conjunctival swab culture) in this region is also unknown. Acute conjunctivitis has symptoms of less than 3 to 4 weeks of duration. Some reports indicate that 50-75% of acute conjunctivitis is caused due to the bacteria.⁹ The disease lasts for 7 to 10 days. Clinical features seen in bacterial conjunctivitis include red eye, chemosis and discharge which can be mucopurulent or purulent. The incubation period is 1-7 days. The communicability is 2-7 days. The Aim of our study was to evaluate the bacteriological pattern in culture positive cases of acute bacterial conjunctivitis.

Material and Methods

A prospective observational study was conducted in the Department of Ophthalmology, AIIMS Patna, Bihar, India for 1 year, after taking the approval of the protocol review committee and institutional ethics committee.

Methodology

Total 120 patients with clinically diagnosed conjunctivitis were selected for the study. Clinical data and Conjunctival swabs collected by standard method. Duration of less than 15 days was considered acute conjunctivitis. Patients with history of previous medication for similar complaints in the immediate past and trachoma and allergic conjunctivitis cases were excluded from the present study. A standard questionnaire is completed for each patient to evaluate the following- demographic factors, medical history, occupational and allergic histories, past and family histories, characteristics of the patient's ocular complaints, any previous diagnostic studies undertaken, the clinical diagnosis and treatment. A complete external examination of each eye including lids, conjunctiva, cornea, preauricular and submandibular lymph nodes, slit lamp bio-microscopy of the anterior segment, application of Fluorescein to the ocular surface and Schirmer's test where needed. Condition of the lids is noted for any evidence of oedema, blepharitis, mucous crusts, madarosis, tylosis, trichiasis, ectropion, etc. The samples are first directly inoculated onto selective media like Blood agar, Chocolate agar and McConkey's medium. Bacteria are then identified on the basis of cultural characteristics and bio-chemical tests.

Statistical analysis

The recorded data was compiled entered in a spreadsheet computer program (Microsoft Excel 2010) and then exported to data editor page of SPSS version 20 (SPSS Inc., Chicago, Illinois,

USA). Descriptive statistics included computation of percentages, means and standard deviations were calculated.

Results

Out of 120 cases high number of cases of acute conjunctivitis was seen in the age group of 26–35. Second age group observed for the cases of acute conjunctivitis is 36-45years and above. Age group of 18-25 shows less no of cases. Male preponderance is observed in all age groups.

Table 1: Demographic Profile of Patients

	Male	Female	Total
Age			
18-25	6	5	11
26-35	40	23	63
36-45	18	13	31
Above 45	11	4	15
Socioeconomic status			
Low socioeconomic	55	25	80
Middle socioeconomic	30	10	40
Total	75	45	120

A male preponderance is noted with 75 males and 45 females. According to our study acute conjunctivitis was observed in low socioeconomic patients as compare to middle socioeconomic status. Total 80 patients were from low socioeconomic status and 40 cases were from middle socioeconomic status.

Table 2: Bacterial isolates in acute conjunctivitis

Total No. of cases		
Bacterial species	No. =120	Percentage
<i>Coagulase positive staphylococci</i>	51	42.50
<i>Klebsiella pneumoniae</i>	14	11.67
<i>Pseudomonas aeruginosa</i>	7	5.83
<i>Haemophilus species</i>	4	3.33
<i>Diphtheroids</i>	3	2.50
Total	79	65.83

All 120 patients underwent Gram stain and bacterial culture out of 120, 79 patients was culture positive and other was negative.

In the present study, the most common organism isolated Coagulase positive staphylococci 42.5% followed Klebsiella pneumoniae with 11.67%, Pseudomonas 5.83%, Haemophilus species 3.33% and Diptheroids 2.5%.

Table 3: Involvement of the eyes

Involved eye	N=100	Percentage
LE	45	37.5
RE	25	20.83
BE	50	41.67

Table 4: complications in acute conjunctivitis

Signs/complications	N=120	Percentage
Lid Edema	106	88.33
Matting eyelashes	51	42.5
Conjunctival congestion	120	100
Conjunctival chemosis	28	23.33
Petechial Hemorrhage	103	85.83
Conjunctival follicles	98	81.67
Conjunctival papillae	43	35.83
Pseudomembrane	3	2.5
Corneal sensation	106	88.33
Preauricular lymphadenopathy	55	45.83
Complications		8.33
Punctate keratitis	10	6.67
Corneal ulcer	8	

Complications like Petechial haemorrhages were seen in 115 (85.83 %) of the cases while Punctate keratitis was seen in 10 (8.33%). All the cases presented with red eyes, conjunctival congestion is seen in all the cases, lid oedema in 106 (88.33%) cases, matting of eyelashes in 51 (42.5%) cases and preauricular lymphadenopathy in 55 (45.83%) cases, Conjunctival follicles 98 (81.67%) cases and Corneal sensation was present in 106 (88.33%) cases.

Discussion

Acute bacterial conjunctivitis typically presents abruptly with red eye and purulent drainage without significant eye pain, discomfort, or photophobia. Visual acuity does not typically decrease unless large amounts of discharge intermittently obscure vision. In our study out of 120 cases of acute conjunctivitis 63 cases were seen in the age group of 26-35. This age group is more susceptible as this age group is the mainly earning group and active also, they are more exposed to the pathogens. The age group of 36-45 had second highest number of positive culture. The age group of below 25 shows lowest no of cases. Close findings were recorded by Li et al. in a study conducted in a Beijing, China, shows that people of 18-40 years old are at high risk to be infected with acute conjunctivitis, health education on how to avoid catching this disease should be encouraged among them.¹⁰ Total 75 male patients were seen in our study which is 62.5 % and 45 female patients were seen which is 37.5%. Similar findings were noted by K. Aoki et al, that out of One hundred two patients he studied 62 were men which is 60.7% and 40 were women which is 39.35%.¹¹ The number of male patients is more as they are involved in outdoor activities and physical activities.

In our study out of 120 patients 50 patients had a involvement of both eyes which is 41.67% and 70 patients had involvement of only one eye which is 58.33%. The involvement of only one eye is seen which can be due to that the patient visit the OPD before the involvement of the other eye. A study conducted by Mini P. Singh, Jagat Ram,¹² Archit Kumar, Tripti Rungta, Amit Gupta,¹³ Jasmine K. et al showed that conjunctivitis was unilateral in 12 patients (52.2%) and bilateral in 11 patients (47.8%).¹³ In our study out of 120 patients 55 patients had preauricular lymphadenopathy which is 45.83% and 65 patients had no preauricular lymphadenopathy which is 54.17 %. A similar finding was noted in a study done by Balasopoulou et al. which shows that out of 231 cases of conjunctivitis preauricular lymphadenopathy was evident in 125 cases which is 54.2%.¹⁴ According to our study acute conjunctivitis was observed in low socioeconomic patients as compare to middle socioeconomic status. Total 80 patients were from low socioeconomic status which is 66.67 % and 40 cases were from middle socioeconomic status which is 33.33 %. A study done by Pruthi Thekkur, Mahendra M Reddy, Bijaya Nanda Naik, Subitha L, Sitanshu Sekhar Kar in

South India also shows that out of 3193 patients 2666 patients were from low socioeconomic status which is 83.5%.¹⁵ Okesola A O et al at Nigeria revealed Bacterial pathogens in 93.7% conjunctival samples. About one third were *Staphylococcus aureus*, approx 10% Coagulase-negative staphylococci, 22 (6.4%) *Pseudomonas aeruginosa*, 11(3.2%) *Escherichiacoli*, 7(2.1%) *Klebsiellasppecies*, 5(1.5%) *Streptococcus pneumoniae*, 4(1.2%) *Haemophilus influenzae*, 1(0.3%) *Proteusmirabilis*, and1(0.3%) *Neisseriagonorrhoeae*. The maximum of conjunctivitis were found among infants and children (0-10years).¹⁶ The rate of isolation of Coagulase positive staphylococcus is 42.5% in the present study. The rate in other studies varies from 8.0% to 72.5%.¹⁷⁻²⁰ Acute infective conjunctivitis is a common presentation in primary healthcare. It is usually a mild condition and serious complications are rare. Clinical signs are a poor discriminator of bacterial and viral causes. Studies of treatment show that there is a high rate of clinical cure without any treatment. Treatment with topical antibiotics improves the rate of clinical recovery and this is more marked in the first 2-5 days after presentation, but less by 6-10 days. Studies comparing treatment with different antibiotics do not demonstrate that any one antibiotic is superior; the choice of antibiotic should be based on consideration of cost and bacterial resistance.²¹

Patients suffering from bacterial conjunctivitis should be advised not to touch their eyes with hands. In order to prevent the transmission of the disease it is very important to educate patients about their infectious nature and the importance of finishing their antibiotic regimen. Patients should also change their towel and wash cloth daily and should not share them with others. Patients must follow their ophthalmologist's instructions on proper contact lens care.

Conclusion

We conclude, bacteriological evaluation of conjunctivitis provides to the ophthalmologist a working knowledge of the causal microbes, their common presentations, clinical course and antibiotic sensitivity patterns along with confirming the clinical diagnosis. It also helps to avert the use of inappropriate medications and reduce the risk of drug resistant strains. To achieve this end, public awareness particularly of conjunctivitis, its cause, routes of spread and medical management should be sought.

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