

Observational Study of Organisms Isolated from Acute Bacterial Conjunctivitis

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Abstract

Aim: The aim of the present study to determine the bacteriological profile of acute conjunctivitis.

Methods: This prospective observational study was carried out in the Department of ophthalmology, Jawaharlal Nehru Medical College and Hospital, Bhagalpur, 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: All 100 patients underwent Gram stain and bacterial culture out of 100, 69 patients were culture positive and other was negative. In the present study, the most common organism isolated Coagulase positive staphylococci 42% followed Klebsiella pneumoniae with 12%, Pseudomonas 6%, Diptheroids 3% and least Alkaligenes fecalis was 2%. Out of 100 patients 45 patients had a involvement of both eyes which is 45% and 55 patients had involvement of only one eye which is 55%. Complications like Petechial haemorrhages were seen in 83(83 %) of the cases while Punctate keratitis was seen in 8(8%). All the cases presented with red eyes, conjunctival congestion is seen in all the cases, lid oedema in 85(85%) cases, matting of eyelashes in 41(41%) cases and preauricular lymphadenopathy in 45(45%) cases, Conjunctival follicles 79(79%) cases and Corneal sensation was present in 85(85%) cases.

Conclusion: we concluded that the 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.

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

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Introduction

Conjunctivitis is an inflammation of the outermost layer of the white part of the eye and the inner surface of the eyelid[1] It makes the eye appear pink or reddish. It may be associated with pain, burning, scratchiness, or itchiness. The affected eye may have increased tears or be "stuck shut" in the morning. Conjunctivitis can affect one or both eyes[2]. Due to allergies itching is more common[3] Viral etiology was the main reason for most of the outbreaks[2,4] Even during an outbreak, the number of conjunctivitis cases clinically reported will be less as it is usually benign and self-limiting condition and use of over the counter drugs for the same will decrease the reporting. Acute conjunctivitis has a symptom of less than 3 to 4 weeks of duration. Some reports indicate that 50-75% of acute conjunctivitis are caused due to the bacteria[5] The estimated incidence of bacterial conjunctivitis in one study was 135 in 10000. In adults *Staphylococcus*, *Streptococcus pneumoniae* and *Haemophilus influenza* are the common pathogens causing bacterial conjunctivitis. 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. Visual acuity is usually normal in the absence of severe punctuate epitheliopathy. In 78-80% of infectious conjunctivitis cases, infection is initiated by bacteria. Bacterial agents play a central role in the development of infectious conjunctivitis, especially in children. The major bacterial causes of conjunctivitis are *Staphylococcus*, *Streptococcus pneumoniae*, and *Haemophilus influenza*[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 a symptom of less than 3 to 4 weeks of duration. Some reports indicate that 50-75% of acute conjunctivitis are 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 the present study to determine the bacteriological profile of acute conjunctivitis.

Material and methods

This prospective observational study was carried out in the Department of ophthalmology, Jawaharlal Nehru Medical College and Hospital, Bhagalpur, Bihar, India, for 1 year.

Methodology

Total 100 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.

Results

Out of 100 cases high number of cases of acute conjunctivitis was seen in the age group of 25–35. Second age group observed for the cases of acute conjunctivitis is 35-45 years and above. Age group of below 25 years shows less no of cases. Male preponderance is observed in all age groups.

Table 1: Demographic Profile of Patients

Variables	Male	Female	Total
Age			
Below 25 years	6	2	8
25-35	32	20	52
35-45	17	8	25
Above 45	10	5	15
Total	65	35	100
Socioeconomic status			
Low socioeconomic	44	25	69
Middle socioeconomic	21	10	31
Total	65	35	100

A male preponderance is noted with 65 males and 35 females. According to our study acute conjunctivitis was observed in low socioeconomic patients as compared to middle socioeconomic status. Total 69 patients were from low socioeconomic status and 31 cases were from middle socioeconomic status.

Table 2: Bacterial isolates in acute conjunctivitis

Bacterial species	No. =100	Percentage
Coagulase positive staphylococci	42	42
Klebsiella pneumoniae	12	12
Pseudomonas aeruginosa	6	6
Haemophilus species	4	4
Diphtheroids	3	3
Alkaligenes fecalis	2	2
Total	69	69

All 100 patients underwent Gram stain and bacterial culture out of 100, 69 patients were culture positive and other was negative.

In the present study, the most common organism isolated Coagulase positive staphylococci 42% followed Klebsiella pneumoniae with 12%, Pseudomonas 6%, Diptheroids 3% and least Alkaligenes fecalis was 2%.

Table 3: Involvement of the eyes

Involved eye	Number of patients =100	Percentage
LE	35	35
RE	20	20
BE	45	45

Out of 100 patients 45 patients had a involvement of both eyes which is 45% and 55 patients had involvement of only one eye which is 55%.

Table 4: complications in acute conjunctivitis

Signs/complications	Number of patients 100	Percentage
Lid Edema	85	85
Matting eyelashes	41	41
Conjunctival congestion	100	100
Conjunctival chemosis	22	22
Petechial Hemorrhage	83	83
Conjunctival follicles	79	79
Conjunctival papillae	34	34
Pseudomembrane	3	3
Corneal sensation	85	85
Preauricular lymphadenopathy	45	45
Complications		
Punctate keratitis	8	8
Corneal ulcer	6	6

Complications like Petechial haemorrhages were seen in 83(83 %) of the cases while Punctate keratitis was seen in 8(8%). All the cases presented with red eyes, conjunctival congestion is seen in all the cases, lid oedema in 85(85%) cases, matting of eyelashes in 41(41%) cases and preauricular lymphadenopathy in 45(45%) cases, Conjunctival follicles 79(79%) cases and Corneal sensation was present in 85(85%) cases.

Discussion

Conjunctivitis is one of the various infectious diseases that are easily contacted by newborns and elderly individual under poor hygienic conditions. 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 100 cases of acute conjunctivitis 52 cases were seen in the age group of 25-35. 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 35-45 had second highest number of positive cultures. 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 65 male patients were seen in our study which is 65 % and 35 female patients were seen which is 35%. 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 100 patients 45 patients had a involvement of both eyes which is 45% and 55 patients had involvement of only one eye which is 55%. 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 100 patients 45 patients had preauricular lymphadenopathy which is 45% and 55 patients had no preauricular lymphadenopathy which is 55 %. 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 69 patients were from low socioeconomic status which is 69 % and 31 cases were from middle socioeconomic status which is 31%. A study done by Pruthu 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]

In the present study, the most common organism isolated Coagulase positive staphylococci 42% followed Klebsiella pneumoniae with 12%, Pseudomonas 6%, Diptheroids 3% and least Alkaligenes fecalis was 2%. 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%) Escherichia coli, 7(2.1%) Klebsiella species, 5(1.5%) Streptococcus pneumoniae, 4(1.2%) Haemophilus influenzae, 1(0.3%) Proteus mirabilis, and 1(0.3%) Neisseria

gonorrhoeae. The maximum of conjunctivitis were found among infants and children (0-10years)[16]. The rate of isolation of Coagulase positive staphylococcus is 42% 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 concluded that the 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.

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