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Pattern of presentation and the bacterial profile of conjunctivitis: an observational study

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Abstract

Aim: 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, B.R. Singh Hospital Kolkata, WB, India March 2018 to oct 2019. 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 100 cases high number of cases of acute conjunctivitis was seen in the age group of 20–30. Age group of below 20 shows less no of cases. Male preponderance is observed in all age groups. A male preponderance is noted with 60 males and 40 females. Acute conjunctivitis was observed in low socioeconomic patients as compare to middle socioeconomic status.

All 100 patients underwent Gram stain and bacterial culture .out of 100 patients 64 patients was culture positive and other was negative .In the present study, the most common organism isolated Coagulase positive staphylococci 40% followed Klebsiella pneumoniae with 12%, Pseudomonas 5%, Diptheroids and least Alkaligenes fecalis. Complications like Petechial haemorrhages were seen in 90 % of the cases while Punctate keratitis was seen in 9%. All the cases presented with red eyes, conjunctival congestion is seen in all the cases, lid oedema in 92 cases, matting of eyelashes in 42 cases and preauricular lymphadenopathy in 46 cases , Conjunctival follicles 87 cases and Corneal sensation was present in 97 cases. **Conclusion**: This study provides to the ophthalmologist a working knowledge of the causal microbes, their common presentation, clinical course and antibiotic sensitivity pattern. This helps in effectively managing bacterial conjunctivitis. We feel that such comprehensive surveys are necessary to assess the specific characteristics of the acute conjunctivitis, which are unique for each region and population.

Keywords: conjunctivitis, bacterial profile, demographic factors

Introduction

Acute conjunctivitis is defined as the inflammation of conjunctiva of less than 3 to 4 weeks duration, characterized by cellular infiltration and exudation[1,2]. Commonest presentation is foreign body sensation, redness and blurring of vision with associated purulent or mucopurulent discharge[1,3]. The route of spread is mainly reported to be contagious or from own conjunctival flora[4]. In severe cases, corneal, lid or orbital involvement may be seen resulting into various complications[5]. The incidence of conjunctivitis varies. It was 4.6% in primary school children in a centre in Delhi and 3.27 per cent was reported from Patiala city[6].

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The incidence of acute bacterial conjunctivitis ranges from 18.3%- 57% of all acute conjunctivitis in the United States[7]. Conjunctivitis is classified based on cause, like viral, bacterial, fungal, parasitic, toxic, chlamydial, chemical, and other allergic agents. Viral aetiologies are more common than bacterial, and incidence of viral conjunctivitis increases in the late fall and early spring. The aetiology often can be distinguished on clinical grounds. In keratoconjunctivitis, an associated corneal involvement is present. Fitch et al stated that viral conjunctivitis is found mostly in the summer, and bacterial conjunctivitis in winter and spring[2]. Bacterial conjunctivitis can be contracted directly from infected individuals or can result from abnormal proliferation of the native conjunctival flora[8]. Most causes of conjunctivitis are benign, with a self-limited process; however, depending on the immune status of the patient

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and the aetiology, conjunctivitis can progress to increasingly severe and sight-threatening infections
Prevalence and etiology of acute bacterial conjunctivitis varies from place to place, even within the same country owing to geographical, cultural and socioeconomic variation[9,10].
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.
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.

Material and Methods

An observational study was conducted in the Department of Ophthalmology, B.R. Singh Hospital Kolkata, WB, India. From March 2018 to oct 2019, Total 100 patients with clinically diagnosed conjunctivitis were selected for the study. Clinical data and Conjunctival swabs collected by standard method. Selections for the study were done irrespective of age, sex, occupation, and socio-economic status. Duration of less than 15 days was considered acute conjunctivitis. Cases 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. All examinations were carried out by the same examiner. Acomplete 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 20–30. Second age group observed for the cases of acute conjunctivitis is 30-40 years and above. Age group of below 20 shows less no of cases. Male preponderance is observed in all age groups.

Table 1: demographic profile of patients

	Male	Female	Total
Age			
Below 20	4	4	8
20-30	32	20	52
30-40	14	13	27
Above 40	10	3	13
Total	60	40	100
Socioeconomic status			
low socioeconomic	42	28	70
middle socioeconomic	18	12	30
Total	60	40	100

A male preponderance is noted with 60 males and 40 females. According to our study acute conjunctivitis was observed in low socioeconomic patients as compare to middle socioeconomic status. Total 70 patients were from low socioeconomic status and 30 cases were from middle socioeconomic status.

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Table 2: Bacterial isolates in acute conjunctivitis

Total No. of cases 100		
Bacterial species	No. =100	Percentage
Coagulase positive staphylococci	40	40
Klebsiella pneumoniae	12	12
Pseudomonas aeruginosa	5	5
Haemophilus species	2	2
Diphtheroids	2	2
Alkaligenes fecalis	3	2
Total	64	100.0

Bacteriological Investigations: All 100 patients underwent Gram stain and bacterial culture. Out of 100 patients 64 patients was culture positive and other was negative.

In the present study, the most common organism isolated Coagulase positive staphylococci 40% followed Klebsiella pneumoniae with 12%, Pseudomonas 5% , Diptheroids and least Alkaligenes fecalis .

Table 3: Eye involvement

Involved eye	N=100	Percentage
LE	35	35
RE	25	25
BE	40	40

Table 4: Signs and complications seen in acute conjunctivitis patients in our study

Signs/complications	N=100	Percentage
Lid Edema	92	92
Matting eyelashes	42	42
Conjunctival congestion	100	100
Conjunctival chemosis	24	24
Petechial Hemorrhage	90	90
Conjunctival follicles	87	87
Conjunctival papillae	36	36
Pseudomembrane	3	3
Corneal sensation	97	97
Preauricular lymphadenopathy	46	46
Complications Punctate keratitis Corneal ulcer	9 7	9 7

Complications like Petechial haemorrhages were seen in 90 % of the cases while Punctate keratitis was seen in 9%. All the cases presented with red eyes,, conjunctival congestion is seen in all the cases, lid oedema in 92 cases, matting of eyelashes in 42 cases and preauricular lymphadenopathy in 46 cases, Conjunctival follicles 87 cases and Corneal (table 4) sensation was present in 97 cases.

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Discussion

In our study out of 100 cases of acute conjunctivitis 52 cases were seen in the age group of 20-30. 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 30-40 and above had second highest number of positive culture. The age group of below 20 shows lowest no of cases. Close findings were recorded by Li et al. in a study conducted in a Beijing, China, 2011-2013 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[11].

Total 60 male patients were seen in our study which is 60 % and 40 female patients were seen which is 40%. 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 39.3 5[12]. The no of male patients is more as they are involved in outdoor activities and physical activities.

In our study out of 100 patients 40 patients had an involvement of both eyes which is 40% and 60 patients had involvement of only one eye which is 60%. 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,[13] Archit Kumar, Tripti Rungta, Amit Gupta,[13] Jasmine Khurana, Radha Kanta Ratho in Chandigarh, India in Jan March 2018 showed that conjunctivitis was unilateral in 12 patients (52.2%) and bilateral in 11 patients (47.8%)[14].In our study out of 100 patients 46 patients had preauricular lymphadenopathy which is 46% and 54 patients had no preauricular lymphadenopathy which is 54 %. A similar finding was noted in a study done by Balasopoulou et al. during March 2012 to June 2012 which shows that out of 231 cases of conjunctivitis preauricular lymphadenopathy was evident in 125 cases which is 54.2%[15].According to our study acute conjunctivitis was observed in low socioeconomic patients as compare to middle socioeconomic status. Total 70 patients were from low socioeconomic status which is 70 % and 30 cases were from middle socioeconomic status which is 30 %. A study done by Pruthu Thekkur, Mahendra M Reddy, Bijaya Nanda Naik, Subitha L, Sitanshu Sekhar Kar in South India during September – November 2014 also shows that out of 3193 patients 2666 patients were from low socioeconomic status which is 83.5%[16].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)[17]. The rate of isolation of Coagulase positive staphylococcus is 40% in the present study. The rate in other studies varies from 8.0% to 72.5%[18-21]. 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[22].

Conclusion

This study provides to the ophthalmologist a working knowledge of the causal microbes, their common presentation, clinical course and antibiotic sensitivity pattern. This helps in effectively managing bacterial conjunctivitis. We feel that such comprehensive surveys are necessary to assess the specific characteristics of the acute conjunctivitis, which are unique for each region and population

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