

Occurrence of Bacterial Conjunctivitis and Viral Conjunctivitis in Pakistan

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ABSTRACT

Aim: To identify the prevalence of bacterial and viral conjunctivitis.

Study design: Prospective study.

Place and Duration of Study: Department of Ophthalmology, Pakistan Railways Hospital, Islamic International Medical College, Rawalpindi from 1st April 2021 to 30th September 2021.

Methodology: Fifty conjunctivitis patients enrolled within age of 14-29 years. Clinical examination, slit lamp test and lab testing separated cases as viral or bacterial conjunctivitis. Polymerase chain reaction post culturing was used in viral conjunctivitis cases while Kirby-Baur disc diffusion assay was used in bacterial conjunctivitis confirmation.

Results: There were 91.17% patients with viral conjunctivitis in age of 24-29 years and 62.5% patients with bacterial conjunctivitis within 14-18 years. The odds ratio value between the male and female gender showed a significant difference between both genders with 95% confidence interval with higher female frequency in both. Coronavirus cases were highest with 52.9% while cases of *Micrococci* were highest as 37.5% with conjunctivitis.

Conclusion: Viral conjunctivitis was more common in general cases due to recent covid-19 infection followed by *Micrococci* bacterial conjunctivitis.

Keywords: Allergic conjunctivitis; Bacterial conjunctivitis; Children; Vision Impairment

INTRODUCTION

Conjunctivitis known as pink eye caused by the inflammation of the conjunctiva. The major reasons of conjunctivitis are either bacterial, viral or allergic reactions. It can appear at any age and results in 75% of conjunctivitis cases worldwide^{1,2}. Clinical characteristics of viral conjunctivitis comprises of redness as well as blood-vessel engorgement, discharge from the ocular region or pain and photophobia with involvement of pseudo membranes. Even in the developed countries viral conjunctivitis results in high cost burden³.

Children are more prone towards viral conjunctivitis while adults more frequently get bacterial conjunctivitis than viral conjunctivitis.⁴ The main factors in causing viral conjunctivitis are air borne viral influx or through swimming pools^{5,6}. Majority of the virus which results in conjunctivitis condition are adenoviruses and covid-19 conjunctivitis in recent years.⁷ Corneal infections are formed as the virus invades in the epithelium as well as anterior-stroma which leads to superficial punctate-keropathy and subepithelial-infiltrates⁸⁻¹⁰.

The occurrence of bacterial conjunctivitis is documented as 4% in the developing world. Unhygienic practices, environmental influx are the major cause for bacterial conjunctivitis in many children and adults.¹¹⁻¹³ The present study was conducted to identify the occurrence rate as prevalence of viral and bacterial conjunctivitis in the Pakistani patients.

MATERIALS AND METHODS

This prospective study was done at Department of Ophthalmology, Pakistan Railways Hospital, Islamic International Medical College, Rawalpindi from 1st April 2021 to 30th September 2021. An informed consent was gained from each study participants. A total of 50 patients were included in the study depending upon their clinical symptoms as well as lab testing results. The age of the patients was between 14-29 years. The clinical symptoms of conjunctivitis were as redness with rapid beginning of sensation as well as blood-vessel engorgement, discharge from the ocular region or pain and photophobia in case of viral infections while itching, inflamed mucopurulent eye with matting of eyelids in the

morning time was noticed while waking and with watery discharge in case of bacterial infections. Slit lamp test was used for examining conjunctivitis presence. Conjunctival swab test was performed in cases where bacterial conjunctivitis was suspected while in cases where there was viral conjunctivitis then a 4 weeks response to steroidal management or combination with anti-infective corticosteroids was observed before lab testing was done for analyzing the severity of the infection. Patients having viral conjunctivitis often also had upper respiratory tract infections in addition to fever, lethargy and swollen lymph nodes. The more serious condition as uveitis or keratitis or scleritis was properly observed in viral conjunctivitis patients. Viral conjunctivitis lab testing involves cell culturing and PCR examination. Bacterial conjunctivitis is analyzed through anti-microbial resistance post cell culturing and Kirby Baur disc diffusion method. Data was entered and analyzed by SPSS version 26.0 using Chi square, odds ratio value as well as mean and standard deviations. P value less than 0.05 as significant.

RESULTS

91.17% patients suffering from viral conjunctivitis to be within the age of 24-29 years while 62.5% of patients having bacterial conjunctivitis were within the age limit of 14-18 years. The mean age was 18.3±3.7 years. There was a significant variance within ages of viral and bacterial conjunctivitis (Table 1).

Table 1: Age related prevalence of viral and bacterial conjunctivitis

Age (years)	Viral Conjunctivitis	Bacterial Conjunctivitis	P value
14-18	1 (2.94%)	10 (62.5%)	0.009
19-23	2 (5.88%)	3 (18.75%)	0.049
24-29	31 (91.175)	3 (18.75%)	0.049
Total	34 (100%)	16 (1005)	0.041

The odds ratio value between the male and female gender showed a significant difference between both genders with 95% confidence interval. There were 44.11% males and 55.8% females in viral conjunctivitis cases while in bacterial conjunctivitis cases there were 62.5% males and 37.5% females. The p value was <0.001 (Fig. 1, Table 2).

The frequency of coronavirus was highest with 52.9% in conjunctivitis cases followed by Adenovirus as 44.1%. No case of

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Herpes Simplex Virus was reported. In bacterial conjunctivitis patients' highest cases of *Micrococci* as 37.5% and *Diphtheroid* as 31.25% was observed (Table 3).

Table 2: Comparison of Odds ratio of viral and bacterial conjunctivitis in males and females

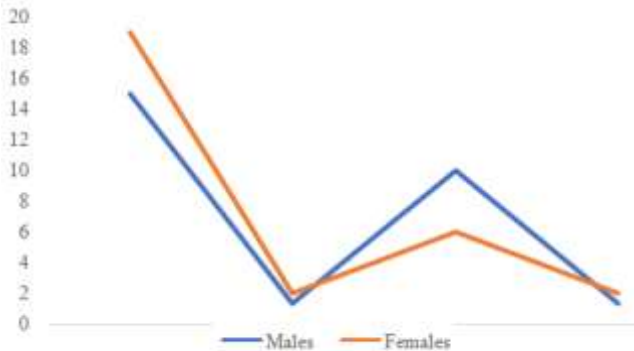
Gender	Viral conjunctivitis Odds Ratio 95% CI (n=34)		Bacterial conjunctivitis Odds Ratio 95% CI (n=16)	
	No.	%	No.	%
Males	15	1.15	10	1.45
Females	19	1.21	6	1.32

P=0.16

Table 3: Frequency of viral and bacterial types causing conjunctivitis

Types	No.	%
Viral (n= 34)		
Adenovirus	15	44.1
Coronavirus	18	52.9
Chlamydia	1	2.94
Herpes Simplex	-	-
Bacterial (n=16)		
Staphylococcus aureus	1	6.25
Hemophilus influenza	3	18.75
Enteric bacilli	1	6.25
Micrococci	6	37.5
Diphtheroid	5	31.25

Fig. 1: Comparison of viral and bacterial conjunctivitis in males and females



DISCUSSION

Conjunctivitis is one of the commonest eye infection affects patients of all socio-economic class and all ages and genders. Sometimes it can spread to cornea and even cause perforation. Major causes of conjunctivae are certain viruses and bacteria. Bacterial conjunctivitis is usually bilateral that can spread to other eye as well. *Staphylococcus aureus* is the most common bacteria that can cause harm and the main reason of conjunctiva. Type and specie of bacteria also varies round the region of the world. Viral conjunctivitis is responsible for majority of infections and accounts upto 75% of cases¹³⁻¹⁶.

Both these types of conjunctivitis can also be cause due to contact lens. Unhygienic practices and sleeping with lenses sometimes leads to eye infection. Characteristics sign and symptoms of conjunctivitis is redness, dryness, pain, photophobia, foreign body sensation and ocular discharge. Eye drops are considered more effective and safe than ointment because it causes blur vision sometimes^{17,18}.

Awareness programs through print, electronic or social media would prove an effective strategy to enhance and enlighten the public knowledge towards the hygienic practices and timely diagnosis of eye infections. Antiseptic solutions of contact lens are another way through which lens can be sterile before use and could minimize the opportunist bacteria and viruses to cause and spread the infection¹⁹⁻²².

CONCLUSION

Viral conjunctivitis was more common in general cases due to recent covid-19 infection followed by *Micrococci* bacterial conjunctivitis.

Conflict of interest: Nil

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