

# Association of Bacterial Conjunctivitis in Optical Lenses Users

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## ABSTRACT

**Objective:** To find the association of bacterial conjunctivitis in optical lenses users.

**Study Design:** Observational based cross-sectional study

**Place and Duration of Study:** Department of Ophthalmology, People Medical College Hospital Nawabshah from 1<sup>st</sup> April 2021 to 30<sup>th</sup> September 2021.

**Methodology:** Thirty five patients who walked in the out-door department were enrolled. Those patients who had clinical symptoms positive for bacterial conjunctivitis and were using optical lenses were included in the study. Demographic information and information regarding their hygienic practices and usage of optical lenses was entered in a well-structured proforma. Sterile cotton-swabs were used for collecting samples from the lenses. Post 24 hours in broth at 37°C the samples were placed in blood agar for culturing at 37°C for two days. Kirby–Bauer disc diffusion method was then performed for isolation of bacterial cultures using susceptibility of bacteria towards various antibiotics.

**Results:** There 48.75% females which was higher than males (34.28%). Dryness appeared to be the most common symptoms followed by redness and itchy eyes. The culturing and bacterial isolation method for BC showed that micrococci were presented in majority of the cases (n=29) which was followed by diphtheroid in 18 patients.

**Conclusion:** Strong association of bacterial conjunctivitis was found in relation with optical lenses users.

**Keywords:** Conjunctival-flora; optical lenses user; myopia; hygiene

## INTRODUCTION

The conjunctival-flora (CF) is classified as exogenous or endogenous which has the tendency of contraction as a result of environmental factors, physical interaction or lack of hygiene. The normal CF is disturbed when physical contact like usage of lenses is done. The lenses when not cleaned properly can cause CF.<sup>1</sup> These prosthetic devices when come in contact with the eye can cause keratitis. The physical contact of the optical lenses may be temporary or permanent through implantation.<sup>2</sup> The condition which results from the contact of the optical lenses result in an acute form of red eye<sup>3</sup> or corneal ulceration<sup>4</sup> as well as infiltrative-keratitis. The consequence of all the aforementioned can be loss of vision due to scarring of the cornea.<sup>5</sup>

Optical lenses indeed cause ease in myopic person life and therapeutically manage the condition. They are not affected by variance in weather conditions as the glasses may cause fogging and provide improper distorted image. Therefore, majority of the people like to opt optical lenses instead of wearing optical glasses. However due to extra usage of these lenses a high hygiene maintenance becomes mandatory, where lenses need to be kept in clean optical solution for avoiding microbial growth. A poor hygienic condition can lead into microbiome over the lenses which can result into eye infections such as bacterial conjunctivitis.<sup>6,7</sup>

Interruption in the epithelium and corneal hypoxia cause entrance of the bacteria or other microorganisms into the eye. The cases where hygiene is also maintained but the lenses storage is not kept up to mark becomes the key point for infection in majority of the cases.<sup>8,9</sup> Within the last two decades a high incidence of the microbial infection has been reported in various researches.<sup>10,11</sup> The present study was conducted for assessing the strength of association between bacterial conjunctivitis caused as a result of optical lenses usage in this region of the world. The results of this study can provide a better insight in the magnitude of this problem.

## MATERIALS AND METHODS

The present research was conducted at People Medical College Hospital Nawabshah from 1<sup>st</sup> April 2021 to 30<sup>th</sup> September 2021. The patients who participated in this study were asked for signing an informed consent before enrolling as participants of the research. The study type was observational based cross-sectional study. A total of 35 patients who walked in the outdoor ophthalmology department were enrolled as patients.

Ophthalmological examination using a slit lamp was made. Their clinical symptoms were correlated with the finding of bacterial conjunctivitis. Those patients having ocular disease or long-time ocular infections were excluded from this study. Those patients who had clinical symptoms positive for BC and were using optical lenses were included in the study. Demographic information and information regarding their hygienic practices and usage of optical lenses was entered in a well structured proforma. The optical lenses were taken from each patient for examination by placing them in broth of brain heart infusion (BHI). Sterile cotton-swabs were used for collecting samples from the lenses. Post 24 hours in broth at 37°C the samples were placed in blood agar for culturing at 37°C for two days. Kirby–Bauer disc diffusion method was then performed for isolation of bacterial cultures using susceptibility of bacteria towards various antibiotics. The data was analyzed by SPSS version 25.0 using frequency and percentages value for the qualitative analytes.

## RESULTS

The mean age was 29±5.5 years. There were 48.75% females which was higher than males (34.28%). All the patients were between the age group of 18-45 years. The majority of the patients were from the age group of 18-28 years (Table 1).

The clinical symptoms of the patients who had that highest number of the frequency were having complained of dryness in 48.75% followed by 40% having redness in eyes and 34.28% having itchy eye. The ocular pain was presented in 22.85% of the cases (Table 2).

Majority of the patients as 65% presented with circumciliary-congestion, edema in the central cornea in addition to conjunctival-papillary reaction. In a patient of 41 year a white lesion of 2×2mm dimensions was noticed near to the limbus (Fig. 1).

Table 1: Distribution of age and gender (n=35)

Variable	No.	%
Age (years)		
18-28	17	48.75
29-38	12	34.28
>39	6	17.14
Gender		
Male	12	34.29
Female	23	65.71

Fifty two percent of the cases were using optical lenses >8 hours daily. The culturing and bacterial isolation method for BC showed that micrococci was presented in majority of the cases (n=29) which was followed by diphtheroid in 18 patients. The other type of bacteria was also seen but in smaller number of patients with a significant variance with micrococci and diphtheroid (Fig. 2).

Table 2: Clinical characteristics of patients (n=35)

Variable	No.	%
Dryness	17	48.75
Itching	12	34.28
Redness	14	40
Ocular pain	8	22.85
Foreign body sensation	3	8.57
Photophobia	2	5.71



Fig 1: Lesion observed near limbus

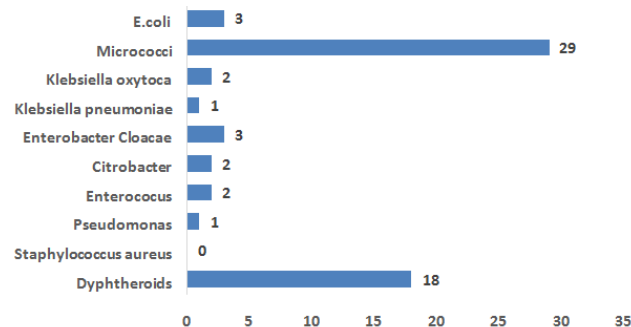


Fig 2: Bacteria isolated from optical lenses culturing

**DISCUSSION**

Bacterial conjunctivitis is considered as one of the main cause of eye infection in contact lens users. Several techniques can be applied to determine the nature and type of bacteria present in lenses.<sup>12-14</sup> In the present study, whole lenses were shifted to the broth after certain time of use where swabbing was done. High percentage of bacterial growth was observed through present technique. Dryness appeared to be the most common symptoms followed by redness and itchy eyes.

Microflora of conjunctiva that was isolated from the eyes was similar in nature as microbial flora already present in contact lenses or from its storage case and its accessories. Antiseptic solution of the lenses care in preventing the microflora would be prove an effective option to combat this problem.<sup>15-17</sup>

High number of resistant bacteria was found. Bacteria were resistant to cefotaxime, amoxicillin clavulanate and ampicillin. Efficient antibiotic policy should be formulated in consideration of high resistance against several bacteria. The most common bacteria which were isolated from contact lenses was micrococci followed by diphtheroids. Other type of bacteria was also present but they were not in considerable number.<sup>18-21</sup>

**CONCLUSION**

There is a strong association of Bacterial conjunctivitis with usage of optical lenses and need to be managed by good hygienic practices and lenses maintenance.

**REFERENCES**

- Rahim N, Bano H, Naqvi BS. Bacterial contamination among soft contact lens wearer. Pak J Ophthalmol 2008; 24: 93-96.
- Willcox MD, Holden BA. Contact lens related corneal infections. Biosci Rep 2001; 21: 445-461.
- Szczotka-Flynn LB, Pearman E, Ghannoum M. Microbial contamination of contact lenses, lens care solutions, and their accessories: A literature review. Eye Contact Lens 2010; 36: 116-29.
- Wu P, Stapleton F, Willcox MD. The causes of and cures for contact lens-induced peripheral ulcer. Eye Contact Lens 2003; 29 (1 Suppl): S63-66.
- Edwards K, Keay L, Naduvilath T, Snibson G, Taylor H, Stapleton F. Characteristics of and risk factors for contact lens-related microbial keratitis in a tertiary referral hospital. Eye (Lond) 2009; 23: 153-60.
- Stapleton F, Keay L, Edwards K, Naduvilath T, Dart JK, Brian G, et al. The incidence of contact lens-related microbial keratitis in Australia. Ophthalmology 2008; 115: 1655-62.
- Whitcher JP, Srinivasan M, Upadhyay MP. Microbial keratitis. In: Johnson GJ, Minassian DC, Weale RA, West SK, eds. The epidemiology of eye diseases. 2<sup>nd</sup> ed London: Arnold; 2003; 190-95.
- Dart J. The inside story: why contact lens cases become contaminated. Cont Lens Anterior Eye 1997; 20: 113-8.
- Stapleton F, Dart JKG, Seal DV, Matheson M. Epidemiology of Pseudomonas aeruginosa in contact lens wearers. Epidemiol Infect 1995; 114: 395-402.
- Liesegang TJ. Contact lens-related microbial keratitis: part I: epidemiology. Cornea 1997; 16: 125-31.
- Stapleton F, Jalbert I, Cole N. The epidemiology of contact lens related infiltrates. Optom Vis Sci 2007; 84: 257-72.
- Hall BJ, Jones L. Contact lens cases: the missing link in contact lens safety? Eye Contact Lens 2010; 36: 101-5.
- Kugadas A, Gadjeva M. Impact of microbiome on ocular health. Ocul Surf 2016; 14: 342-9.
- Willcox M. Characterization of the normal microbiota of the ocular surface. Exp Eye Res 2013; 117: 99-105.
- Shin H, Price K, Albert L, Dodick J, Park L, Dominguez-Bello M. Changes in the eye microbiota associated with contact lens wearing. MBio 2016; 7(2): e00198.
- Koneman EW, Allen SD, Janda WM, Shreckenberger PC, Winn WC. Colour atlas and textbook of diagnostic microbiology. 7<sup>th</sup> ed. Philadelphia: Lippincott-Raven Publishers; 2017; 69-113.
- Lipener C, Nagoya FR, Zamboni FJ, Lewinski R, Kwitko S, Uras R. Bacterial contamination in soft contact lens wearers. CLAO J 1995; 21: 122-4.
- Emina MO, Idu FK. Bacteria and parasites in contact lenses of asymptomatic wearers in Nigeria. J Optom 2011; 4: 69-74.
- Ibrahim IA, AL-Hadaria SA, Fayidh MA. Bacterial contamination of contact lenses among some female students and employees of Ibn AL Haitham, University of Baghdad. Ibn Al Haitham J Pure ApplSci 2008; 21: 9-22.
- Thakur DV, Gaikwad UN. Microbial contamination of soft contact lenses & accessories in asymptomatic contact lens users. Indian J Med Res 2014; 140: 307-9.
- Rau G, Seedor J, Shah M, Ritterband D, Koplin R. Incidence and clinical characteristics of Enterococcus keratitis. Cornea 2008; 27: 895-9.