Original Article

Complications of Contact Lenses; A Clinico-experimental Study to Evaluate the Effects of Bacterial Contamination

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Purpose: To diagnose the complications and to study the effects of isolated bacteria from contact lens users on rabbit eyes.

Material and Methods: A total of 100 contact lens wearers were subjected to clinical examinations. Contact lenses/or corneal swabs from 100 patients were collected for bacteriological examinations. The isolated bacteria were tested for pathogenicity through experimental study that was conducted on rabbits with the aid of clinical, serum biochemistry and histopathological examinations.

Results: Among the 100 contact lens users, 23 were men and 77 women. The mean age was 21 years. Clinical examination revealed keratitis in 52% of contact lenses users, out of that 48% showed corneal infiltrates and 4% exhibited superficial corneal ulcer. Corneal abrasions, giant papillary conjunctivitis (GPC) and increased limbal neovascularization were found in 8, 10 and 6% of cases; respectively. In addition to this, nonspecific complications were found in 24% of cases.

Lab investigations of the 100 collected contact lenses/corneal swabs revealed bacterial isolates from 28 samples. The isolated bacteria were identified as Staphylococcus aureus, Staphylococcus epidermidis, Pseudomonas aeruginosa**,** Escherichia coli and Klebsiella pneumonia from 7, 3, 10, 2 and 2 cases respectively and their antimicrobial sensitivity was done whereas multiple bacteria were detected in 4 samples.

In parallel to the above study, the induced experimental eye infection of rabbits was performed which showed corneal abscess and corneal ulcers in case of Pseudomonas aeruginosa and Staphylococcus aureus induced corneal ulcers and clinical picture of the patients who proved culture positive results for pseudomonas aeruginosa and staphylococcal aureus was worse as compared to other patients. E coli or Klebsiella pneumonia developed macular and leucomatous types of corneal opacities.

The infected rabbits showed varied biochemical changes regarding urea, creatinine and uric acid levels and the rabbits infected with pseudomonas aeruginosa showed almost double increase of serum uric acid level (p□0.05).

Conclusion: *Keratitis* was the most predominant complication among contact lens users. Contact lens over wear, overnight wear and poor hygiene are the common causes of contact lens complications. Proper contact lens care and regular follow-up visit are essential for patient safety and wearing success.

Contact lens wearing is associated with a significant risk of microbial keratitis leading to severe sight – threatening complications.[1] Acanthamoeba keratitis although not so common but is severe vision threatening condition in contact lens users and increased risk of microbial and sterile keratitis has been reported with both conventional hydrogel and highly oxygen permeable silicone hydrogel materials.[2-4] Patients using soft contact lenses are at greater risk of developing microbial keratitis than those using other lenses and there is increased risk of microbial keratitis in daily disposable lens users.[7-8] Different organisms have been associated with contact lens – related microbial keratitis.

Ulcerative keratitis is one of the most serious complications of contact lens wear, occurring in an estimated 1 out of 500 persons using contact lenses for extended wear.[7-9] The Gram-negative bacterium, Pseudomonas aeruginosa, is the most commonly isolated bacteria from contact lens-related ulcerative keratitis.[7-10] It causes a rapidly destructive ulcer, which often leads to scarring and vision loss in otherwise healthy persons.

Several investigators have suggested that contact lenses may provide the vehicle whereby organisms are transferred from the environment to the anterior eye.[10-12]

The ocular surface of healthy individuals inherently supports a small population of bacteria, typically coagulase negative staphylococci (CNS) which are believed to exist as commensals on the mucosa and lid margins.[13,14] Under ideal conditions, there is little or no opportunistic bacterial colonization of the conjunctiva or cornea, because of the washing effect of the tears,[14-16] in conjunction with the action of antibacterial proteins and enzymes within the tear film.[17-19] Dry eye, due to tear deficiency or excessive tear evaporation is often associated with ocular surface conditions such as anterior blepharitis[20,21] and keratitis.[22,23] Different alterations in the concentration and type of bacteria have been reported, independent of the presence of conjunctivitis. Such disorders have been associated with several Gram – positive and negative bacteria, including Staphylococcus aureus, Streptococcus sp., Bacillus subtilis, Rhodococcus sp., Pseudomonas aeruginosa, Haemophilus influenza, Haemophilus aegyptius, and Klebsiella sp.[24,25] The production of lipases and toxins by many of these bacteria may induce significant ocular irritation.[26,27]

The present study is aimed to diagnose the complications associated with the use of contact lenses together with identification of the bacterial contamination and to study its pathogenesis in rabbit cornea.

MATERIAL AND METHODS

Patients and sampling:

A cross sectional study was conducted during December 2010 to May 2011 in collaboration with King Fahd Specialist Hospital, Buraidah, Saudi Arabia. About 100 patients suffering from contact lens related problems were received in emergency department were interviewed and detailed ocular examination were performed.

Patients were received with painful red eyes either coming directly or referred by ophthalmologists or peripheral health units and detailed examinations were performed after the history about age, gender, the use of contact lenses, overnight use, duration, type of contact lenses, duration of symptoms, any use of antibiotic drugs before coming to hospital, change and type of solutions, instructions for use and personnel hygiene. The patients were examined for visual acuity, corneal epithelial defects, number and position of corneal infiltrates and anterior chamber reaction.

Regular overnight use of contact lenses and sleeping in lenses overnight once per week or more was considered as overnight wear also known as extended wear. Occasional use of contact lenses in sleep was not considered as overnight use.

Hundred corneal scrapings/contact lenses (68/32) were collected under aseptic conditions, kept in ice box and transferred immediately to the laboratory for bacteriological examinations. Patients with diabetes mellitus, associated infectious ocular disease, dry eyes, Keratoconus using contact lenses and aphakic contact lenses, any traumatic / non-traumatic corneal disease and all other causes of keratitis were excluded from the study.

Bacteriological isolation and identification technique:

This technique was done routinely in all collected samples including culturing, sub culturing and purification, isolation and identification. The collected swabs were inoculated in tryptic soya broth overnight at 37°C, consequently the broth was inoculated onto Blood agar, MacConkey's agar, Mannitol salt agar, and Chocolate agar media and incubated aerobically at 37°C for maximum up to 48 hours. Inoculated chocolate agar plates were left in anaerobic incubator at 5% CO_2. All the bacterial isolates were identified by

their colony morphology, Gram staining, pigment production, relevant biochemical tests and API strips.
Bacterial inoculum were prepared by Cultivating each bacterial species onto nutrient agar for 24 hours at 37° C, then 5-7 colonies were transferred to a tube containing 5 ml sterile normal saline solution. The tubes were vortexed to make a bacterial suspension with turbidity equal to 0.5 McFarland's standard solution. Then, 0.5 ml of bacterial suspension was dropped to the corneal ulcer of the experimental animal.

Antimicrobial Sensitivity test:

The isolated pathogenic bacteria were tested to various antibiotics using some selected antibiotics discs through agar-well diffusion method as recommended by the manufacturer. All bacterial isolates were tested for their antimicrobial susceptibility against Cefoxitin (30µg), Gentamicin (10µg), Ciprofloxacin (5µg), Cefuroxime (30µg), Tobramycin (10µg), chloramphenicol (30ug) and Tetracycline (30µg). All experiments were carried out in triplicate. Each isolate was spread onto the surface of Muller- Hinton agar with a sterile swab. After 24 h of incubation, inhibition zones were measured. Control wells were filled with 50 ml. of 0.1 M potassium phosphate buffer of pH 7. The results of susceptibility were recorded as Sensitive(S), Intermediate (I) or Resistant(R).

Experimental study

Animals

This experimental was study conducted on 50 healthy male albino rabbits. The rabbits were obtained from animal health Unit at Qassim University7 days before starting the experiment. The animals were free of any infection, weighing between 2 and 2.5 kg. They were housed in standard aluminum cages and fed with standard rabbit diet and normal tap water. The animal house temperature was maintained at 23°C and 12 h drak/light condition. The rabbits were handled as per the international rules implemented in the experimental laboratory animals, Qassim University, KSA.

Experimental Groups and Protocol:

The rabbits were divided randomly into five equal groups. First group was subdivided into two sub-groups. The protocol was done as shown in (Table 1).

Induction of Corneal Ulcer and Bacterial Inoculation:

For the induction of corneal ulcer in rabbit eyes, circular filter papers (5 mm diameter) were produced by standard paper punch and immersed in 1 N NaOH for 5 seconds. Surface anesthesia of rabbit eyes was obtained by topical Alcaine (Proparacain) eye drops for 5 minutes, the eyelids were secured in the open position, then immersed filter paper disc was placed on the central corneal surface and was held gently in position with thumb forceps for 30 seconds. After few minutes, the rabbits eyes of groups 2-5 were contaminated with Pseudomonas aeruginosa, Staphylococcus aureus, E. coli and Klebsiella pneumonia; respectively.

Ophthalmic Examination:

After 24 h of bacterial contamination of the induced corneal ulcer by selected bacteria, the cornea of the rabbits were stained with a fluorescein paper strips. The detailed eye examinations for corneal ulcer was performed by hand held portable Slit-Lamp biomicroscope. The rabbits eyes were followed every day for the signs and symptoms of ulcerative keratitis such as photophobia, blephrospasm, lid edema, conjunctival edema, conjunctiva injection, discharge, corneal abscess and hypopyon. The severity of corneal ulcer was labeled as mild, moderate or severe accordingly (Table 2). The follow up was continued for two weeks.

Biochemical examinations:

After 2 weeks of post ocular infection, rabbits were sacrificed and blood sample were collected directly into tubes and were allowed to clot at room temperature for 30 min and the serum was separated by centrifugation at 1000×*g* for 15 min at 4°C. The serum was separated and saved in aliquots and stored at -20°C before analyzing for liver and kidney function parameters. The infected corneal samples were also taken and preserved for microscopic examinations.

Among 100 contact lens users, eye complications were seen in 23 men and 77 women aged between 12 years to 55 years (mean age 21 years). Most of them were living in urban areas.

Types of Lenses:

The spectrum of lenses used by the patients in this study was as follows, only 2% were using daily disposable lenses and the remaining 98% were using

daily wear lenses. In the daily wear group 65 (66.33%) were using hydrogel and 33 (33.67%) were using silicone hydrogel lenses.

Table 1: Representation of different groups of rabbits with and without corneal ulcer and contamination with different bacteria.

Group / Subgroup	No. of Rabbits	Corneal Ulcer	Bacterial Contamination
1A	5	-	No bacteria
iB	5	+	No bacteria
2	10	+	Staphylococcus aureus
3	10	+	Pseudomonas aeruginosa
4	10	+	Escherichia coli
5	10	+	Klebsiella pneumonia

Table 2: Clinical Rating scale of corneal ulcer of Rabbits Eyes.

No.	Stages	Under Clinical and Portable Slit - Lamp Examination
1	Mild stage	Stain +, photophobia, conjunctivas congestion, lid edema, gray color cornea with surrounding edema and mild discharge.
2	Moderate stage	Stain +, photophobia, blephrospasm, lid edema, matted eye lashes, conjunctivas congestion and edema, gray white color cornea with surrounding edema and pussy discharge.
3	Severe stage	Stain +, lid edema, blephrospasm, conjunctiva injection, corneal abscess, pussy discharge, hypopyon and dry eye.
4	Healing stage	Stain -, slight conjunctiva congestion, no discharge, no photophobia.

Complications associated with contact lenses:
Based on clinical examinations, keratitis of varying degree was found in 52% of cases in which 48% showed corneal infiltrates compatible with bacterial keratitis and 4% showed superficial corneal ulcer. Corneal abrasions of varying degrees without clinical evidence of bacterial infection were found in 8% of cases. Giant papillary conjunctivitis (GPC) was detected in 10% of cases and increased limbal neovascularization was found in 6% of cases, in addition to this non-significant/specific complications in 24% of cases (Fig. 1).

Table 3: Location of corneal infiltrates among keratitis patients.

Corneal Infiltrates	No. of Patients n (%)
Temporal	18 (37.5)
Nasal	20 (41.66)
Central	06 (12.5)
Diffuse	04 (8.34)
Total	48 (100)

Table 4: Frequency of bacterial isolates from the contact lens / corneal scrapings.

Bacterial Isolates	Frequency n (%)
Staphylococcus aureus	7 (25.00)
Staphylococcus epidermidis	3 (10.71)
Pseudomonas aeruginosa	10 (35.71)
Escherichia coli	2 (07.14)
Klebsiella pneumonia	2 (07.14)
Mixed bacteria	4 (14.28)
Total	28 (28.00)

Clinical characteristics of keratitis:
The following criteria were used for bacterial keratitis.

Severe keratitis: Vision loss of ≥ 2 lines of best – corrected visual acuity compared with pre-event data.

Moderate keratitis: No significant vision loss with one or more of: Positive corneal culture, Any part of lesion within or overlapping central 4 mm of corneal, Hypopyon ≥ 2mm in diameter.

Mild keratitis: All other cases of microbial keratitis.

Table 5: Antimicrobial susceptibility of the isolated bacteria using disc diffusion method.

Bacterial Isolates	No	FOX	CN	CIP	CXM	TOB	C	TE
Staphylococcus aureus	7	7 (S)	7 (S)	2 (R) 5 (S)	4 (S) 3 (R)	3 (1) 4 (S)	2 (1) 1 (R) 4 (S)	4 (5) 2 (1) 1 (R)
Staphylococcus epidermidis	3	2 (S) 1 (1)	3 (S)	3 (S)	3 (S)	4 (S) 1 (1)	2 (S) 1 (R)	2 (S) 1 (R)
Pseudomonas aeruginosa	10	10 (R)	10 (S)	10 (S)	10 (S)	10 (S)	5 (S) 5 (1)	10 (S)
Escherichia coli	2	1 (1) 1 (R)	2 (S)	1 (S) 1 (R)	2 (S)	1 (S) 1 (1)	1 (S) 1 (1)	1 (S) 1 (1)
Klebsiella pneumonia	2	1 (S) 1 (1)	2 (S)	1 (S) 1 (1)	1 (S)	1 (S) 1 (R)	1 (S) 1 (R)	1 (S) 1 (1)

FOX = Cefoxitin (30µg), CN = Gentamicin (10µg), CIP = Ciprofloxacin (5µg), CXM = Cefuroxime (30µg), TOB = Tobramycin (10µg), C = Chloramphenicol (30µg) and TE = Tetracycline (30µg)

Table 6: Clinical assessment and follow up of two weeks of different groups of experimental rabbits with contaminated corneal ulcers with different groups of bacteria.

Experimental Groups and Bacteria	1st Day	2nd Day	4th Day	6th Day	8th Day	10th Day	12th Day	14th Day
Control (negative sub group)	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Control (positive sub group)	Mild stage	Mild stage	Mild stage	Healing phase	Healing phase	Central corneal opacity	Central corneal opacity	Nebular type corneal opacity
Staphylococcus aureus	Mild stage	Mild stage	Mild stage	Mild stage (8) Moderate stage (2)	Healing phase (8) Moderate stage (2)	Healing phase	Central corneal opacity	Leucomatous corneal opacity
Pseudomonas aeruginosa	Mild stage	Mild stage	Mild stage Moderate stage (1)	Mild stage (9) Severe stage (1)	Healing phase (9) Severe stage (1)	Healing phase (9) Corneal perforation (1)	Central corneal opacity	Leucomatous corneal opacity (9)
E.coli	Mild stage	Mild stage	Mild stage	Mild stage (8) Moderate stage (2)	Healing phase	Healing phase	Central corneal opacity	Macular corneal opacity (2) (8) Leucomatous corneal opacity (2)
Klebsella pneumonia	Mild stage	Mild stage	Mild stage	Healing phase	Healing phase	Healing phase	Central corneal opacity	Macular corneal opacity (8) Leucomatous corneal opacity (2)

Table 7: Biochemical parameters in Rabbits with contaminated corneal ulcers.

Corneal ulcer inoculation	Urea (mg/dL)	Uric Acid (mg/dL)	Creatinine (mg/dL)	ALT (U/L)	AST (U/L)
Negative Control	29.53 ± 3.54	0.64 ± 0.08	0.87 ± 0.12	27.92 ± 1.45	14.98 ± 1.11
Pseudomonas aeruginosa	68.23 ± 4.43**	0.24 ± 0.03	0.57 ± 0.07	27.60 ± 2.13	15.23 ± 2.14
Staphylococcus aureus	22.71 ± 2.14	0.67 ± 0.004	0.94 ± 0.065	16.18 ± 2.98	17.45 ± 3.34
E coli	28.72 ± 2.98	0.72 ± 0.04	1.28 ± 0.01	30.30 ± 2.98	9.36 ± 1.12
Klebsiella pneumonia	36.91 ± 3.23*	0.72 ± 0.08	1.22 ± 0.08	23.16 ± 2.43	11.42 ± 1.96

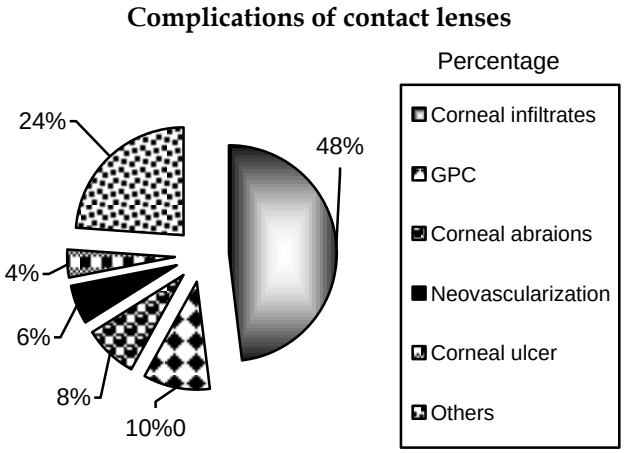

Fig.1: Description of the percentage of different complications observed in contact lens users.

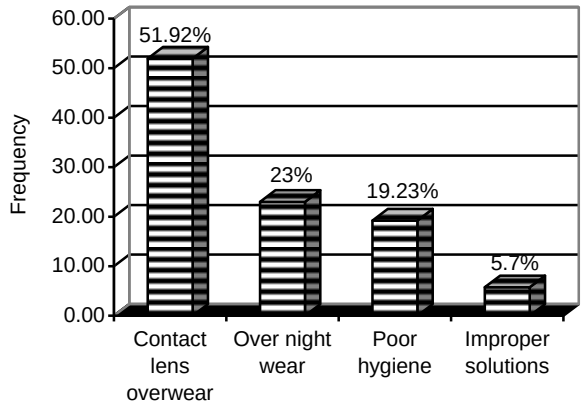

Fig. 2: Represents the frequency of various risk factors like contact lens over – wear, overnight wear, poor hygiene, and improper contact lens solution among contact lens users.

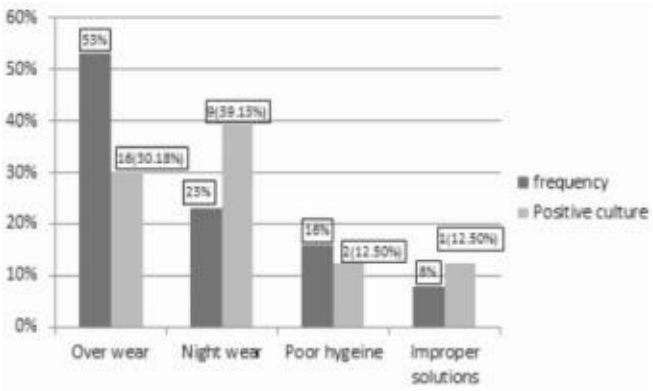

Fig. 3: This figure represents the percentage of positive cultures of bacteria with over-wear, night wear, poor hygiene and improper contact lens solutions in contact lens users

Among patients with a corneal infiltrates and corneal ulcers which were compatible with a diagnosis of keratitis, 35 cases were examined for the first time in the emergency department, 17 cases were referred by general practitioners or ophthalmologists.

The clinical course of these patients was acute with lid and conjunctival edema, reduced vision, pain, redness, photophobia and discharge. Keratitis involved the right eye in 57% (30) of cases, and the left eye in 43% (22) of cases. Infection was bilateral in six cases. Visual acuity at the time of examination ranged from 20/20 to 20/200.

Nasal infiltrates were most common and seen in 20 (41.66%) patients. Corneal infiltrates were single in 40 eyes (83.34%) and multiple in 8 (16.66%). Anterior chamber inflammation was absent in 21 (40.39%) cases. A 1+ to 2+ Tyndall effect was present in 9(55.77%) of cases, whereas severe anterior chamber

inflammation (3+ to 4+) and hypopyon were present in 1 (1.92%) each. The location of corneal infiltrate

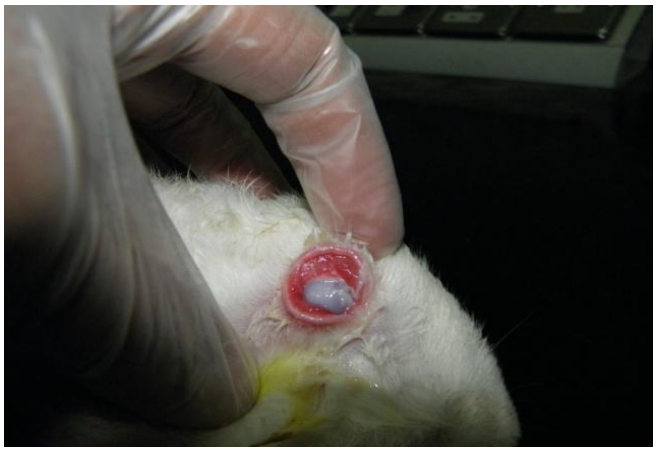

Fig. 4: Rabbit Eye showing Corneal abscess with Hypopyon.

Fig. 5: Rabbit eye showing macular type corneal opacity

among patients is reported in (Table 3). Contact lens over wear was the most common risk factor followed by overnight wear, poor hygienic conditions (hand washing) and improper usage of solutions (Fig. 2).

Microbiological characteristics:

The cultures of corneal scrapings / contact lenses were positive in 28 cases, showing different kinds of bacterial contaminations as shown in (Table 4).

Among the patients who were using daily disposable lenses no bacterial culture was revealed. The patients which were referred from peripheral health units, out of seventeen patients 4(23.52%) were received with use of antibiotics and out of these only 1(25%) reveled positive bacterial culture. No significant difference in risk was observed between lens materials. Also overnight use of lenses was associated with more infection irrespective of material.

As shown in (Table 5), all isolated bacteria were sensitive to Gentamicin (10µg) and Cefuroxime (30µg). The highest culture positive results were detected in overnight contact lens users. Figure 3 shows the association between the risk factors and positive bacterial cultures.

As shown in (Table 6), the rabbits of the control group subdivided into two subgroups, 1stsubgroup (negative control) were kept for the comparison without ulcer, 2nd subgroup (Positive control) where the rabbits eyes with non-contaminated corneal ulcers which developed nebular type of corneal opacities and one rabbit developed macular type of corneal opacity. In 2-5 groups where corneal ulcers were induced in rabbit eyes then contaminated with different types of bacteria. Among pseudomonas induced corneal ulcers, one developed corneal abscess with hypopyon and ultimate perforation within 8-9 days (Figure 4) and others developed leucomatous corneal opacity within two weeks. Staphylococcus aureus induced corneal ulcers developed macular corneal opacity within two weeks period (Figure 5). The rabbits that contaminated with either E coli or Klebsiella pneumonia revealed macular type of corneal opacities in two cases and leucomatous corneal opacity in eight cases within two weeks period.

The biochemical analyses of rabbits with induced corneal ulcer inoculated with different bacteria revealed significant increase ($P < 0.05$) in the level of urea to almost double level with pseudomonas as compared to the control and other bacterial inoculation groups. The level of uric acid and creatinine were higher in E coli and Klebsiella pneumonia inoculated groups as compared to control and other groups (Table 7) but the difference was non-statistically significant ($P > 0.05$).

DISCUSSION

Complications due to contact lens wear affect roughly 5% of contact lens wearers each year[28]. Contact lens–related complications range from self – limiting to sight threatening, that require rapid diagnosis and treatment to prevent vision loss.

Microbial keratitis is a potentially serious corneal infection and a major cause of visual impairment worldwide. A conservative estimate of the number of corneal ulcers occurring annually in the developing world alone is 1.5-2 million[29]. Permanent visual dysfunction has been reported in a significant proportion of patients in both developing[30] and developed[31] countries.

The most common clinical complications compatible with keratitis observed in this study were corneal infiltrates (48%) and corneal ulcer (4%) with overall incidence of keratitis being 52%.The majority of these cases were related to those subjects who were having poor hand hygiene, over wear of contact lenses and in particular over-night wear. Studies conducted throughout the world show that approximately 11% to 49% of patients always fail to wash their hands before handling their lenses. There is an increased risk of 1.5 times for developing microbial keratitis and two times greater risk for developing sterile keratitis[11,12] in patients who fail to wash their hands[32-38]. Sleeping without removing lenses is associated with a tenfold increased risk of microbial keratitis.[37,39,40] A study conducted by Bourcier et al, in Paris showed that contact lenses wear caused bacterial keratitis in 50.3% of cases.[41]

Among the collected corneal scrapings / contact lenses of 100 cases, 28% of cases revealed culture positive results for bacteria and the highest culture positive rate (39.13%) was found in samples which were collected from patients in which overnight wear was common as mentioned in fig.3. Different studies conducted throughout the world have shown greatly variable percentage of culture positive results in microbial keratitis ranging from 48.40% to 100%.[42-48]

A study conducted by Morgan et al, showed that the corneal scrape was performed in 23 of the 38 cases classified as severe keratitis and it yielded a positive culture result for bacteria in nine cases (39.13%) and pseudomonas was cultured in most severe keratitis.[49]

Oral antibiotic therapy has been associated with improved dry eye symptoms, which may be related to a reduction in bacterial counts or bacterial enzymes. Therefore, it is reasonable to propose that there may be an important relationship between ocular surface bacteria, tear film function, and ocular surface inflammation[50]. In the current study Gentamicin (10µg) and Cefuroxime (30µg) are the antibiotic of choice. Nearly similar studies were reported by Kim and Toma.[51]

The production of lipases and toxins by many of these colonizing bacteria may induce ocular surface cellular damage and contributing to tear film instability, inflammation and symptoms of significant ocular irritation.[26,27] These findings were reflected by biochemical parameters.

Contact lens wear can induce a distinctive sterile keratitis, which presents as a sudden onset of an anterior stromal or subepithelial polymorphonuclear leukocyte and mononuclear cell infiltrate typically in the periphery of the cornea. The infiltrates usually are small (0.1 – 2 mm) and may be single or in groups. The infiltrates may be round, oval or arcuate and may underlie either an intact epithelium or an epithelial defect.

As shown in Fig. 2, the major risk factors for contact lens-related microbial keratitis have been related to overwear, overnight use and improper hygiene. A parallel study referred to overnight use of contact lenses, in addition to smoking, male sex and lower socioeconomic status revealed similar results[52]. The findings in (Table 1) where corneal infiltrates can be seen in different localities indicate that contact lens-related corneal infections continues to be a major challenge to ophthalmologists and lens care practitioners.

Eighty percent of bacterial corneal ulcers are caused by *S*taphylococcus aureus, Streptococcus pneumoniae and Pseudomonas species where Pseudomonas aeruginosa is the most frequent and the most pathogenic ocular pathogen which can cause corneal perforation within 72 hours.[53] The clinical course of rabbit eyes which were contaminated with pseudomonas aeruginosa and staphylococcal aureus was more prolonged and worse as compared to eyes contaminated with other bacteria possibly indicating the virulence and pathogenicity of these bacteria.The clinical course of majority of the patients which were proved culture positive for pseudomonas aeruginosa and staphylococcal aureus was also worse as compared to other patients.

In addition to the microbial keratitis, other complications in our study were seen such as giant papillary conjunctivitis (GPC) corneal abrasions and increased neovascularization in 24% of cases. The study conducted by Keech et al., reported CL- induced complications in approximately two fifth of patients. The most recorded common complications were SPK and neovacularization.[54]

CONCLUSION

Despite all the advances in the diagnosis and treatment of bacterial keratitis, it remains the most aggressive and destructive pathogen invading the cornea and is responsible for sight threatening complications. The expansion of contact lenses wear has increased the worldwide incidence of bacterial keratitis**.** Microbial keratitis was the most predominant complication among contact lenses users and Staphylococcus aureus, Staphylococcus epidermidis, Pseudomonas aeruginosa**,** Escherichia coli and Klebsiella pneumonia were common bacterial contaminants of contact lenses. Contact lens overwear, overnight wear and poor hygiene are the common cause of contact lens complications. Proper contact lens care and regular follow-up visit are essential for patient safety and wearing success.

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