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2 - 3
September
2022

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Speaker's name : Neslihan Bayraktar Bilen

I do not have any potential conflict of interest*

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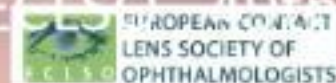
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**EXAMINATION OF EYE INFECTION HISTORY AMONG THE ACTIVE
SOFT CONTACT LENS USERS IN TERMS OF DEMOGRAPHIC DATA,
HAND HYGIENE FEATURES AND SOME USAGE HABITS**

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Introduction

- More than 140 million wearers use contact lenses worldwide.
- Contact lens related microbial keratitis incidence is ~2 to ~20 cases per 10,000 wearers annually.
- Keratitis may result in permanent vision loss.
- Inattentive hand hygiene behavior is an independent risk factor for contact lens-related keratitis.

• Fleiszig SM, Kroken AR, Nieto V, Grosser MR, Wan SJ, Metruccio MM, et al. Contact lens-related corneal infection: Intrinsic resistance and its compromise. Progress in retinal and eye research 2020;76:100804.

• Fleiszig SM, Kroken AR, Nieto V, Grosser MR, Wan SJ, Metruccio MM, et al. Contact lens-related corneal infection: Intrinsic resistance and its compromise. Progress in retinal and eye research 2020;76:100804.

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Purpose

- In this study, we aimed to examine the relationship between soft contact lens (SCL) related infection and some lens usage and hygiene habits

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Methods

- A survey study applied to volunteers before routine CL examination
- A questionnaire sheet was administered to all of the participants and they were asked to answer questions.
- Eye infection history, demographic characteristics and some usage habits were evaluated and analyzed in terms of frequency and statistical significance.
- Inclusion Criteria
 - At least 6 months of SCL usage history for refractive purpose
- Exclusion Criteria
 - Known systemic/ocular disease
 - History of ocular surgery
 - Corneal ectatic disease

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Methods

- 'Did you have an eye infection related to contact lenses?'
- Demographic questions
 - Age
 - Gender
 - Marital status
 - Place of residence
 - Education
 - Income level
- CL type and hand hygiene habits related questions
 - SCL type
 - Daily disposable/Daily replacement/Don't know
 - Hand hygiene habit
 - Rarely / Often / Always
 - Hand hygiene material
 - Only tap water / Bar soap and water / Liquid soap and water
 - Type of hand-drying status
 - No drying/ Disposable towel ,napkin/ Cotton towel

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Results

- 107 SCL wearers completed the questionnaire
- 17.8% of the users have a history of eye infection.
- The relationship between age, gender, marital status, place of residence, income level, SCL type, hand hygiene, hand-drying status and infection was not found to be statistically significant
- Infection rate was found to be significantly lower in two group
 - Hand hygiene with bar soap and water ($p < 0.001$)
 - High school students ($p < 0.001$)

	n,percentage (%)	Infection History Yes 17.8 %	Infection History No 82.2%	p
Age				0.148
12-17	4.5	0	4,6	
18-30	76.6	13	65.4	
31-40	15.3	4,6	11.2	
41-60	1.8	0	0.9	
Gender Female				0.623
Male	73.6	14.9	64.4	
	20.3	2.8	16.8	
Marital Status				0.625
Married	20.7	3.7	17.7	
Single	77.5	14.1	64.4	
Place of Residence				0.209
Home	86.5	14.9	72.8	
Dormitory	10.8	1.8	9.3	
Other	0.9	0.9	0	
Current Education				<0.001
High school	15.3	0	15.8	
University	72.1	13.6	57	
Graduate student	10.8	1.6	9.3	
Average monthly income in 2019(\$)				0.221
0-2000	44.1	8.4	32.7	
2000-5000	37.3	3.7	30.8	
5000-10000	18.6	3.7	14	
>10000 -				

Table 1: Statistical association of demographic characteristics with the infection history

	n,percentage (%)	Infection History Yes 19 (7.4%)	Infection History No 25 (82.2%)	P
Soft contact lens type				
Daily disposable	3.6	0.9	2.8	0.12
Daily replacement	87.4	16.8	71.9	
Don't know	4.5	0	4.6	
Hand washing before handling CL				
Rarely	5.5	0	4.7	
Often	26.9	6.5	18.6	0.088
Always	67.6	11.2	53.2	
Hand Washing with				
Only tap water	5.5	0.9	4.6	
Bar soap and water	19.4	0	19.6	<0.0001
Liquid soap and water	75.1	16.8	64.4	
Type of hand drying after washing				
No drying	11.2	1.8	9.3	0.15
Disposable towel /napkin/	40.2	9.3	30.8	
Cotton towel	48.6	6.5	41.1	

Table 2: Statistical association of hand hygiene habits with the infection history

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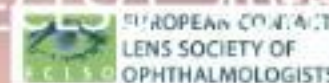
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Discussion

- Poor hand hygiene is a risk factor for microbial keratitis
 - Washing hands prior to lens handling decreases the risk by almost 50 to 75% for moderate/severe microbial keratitis.
 - Poor hand hygiene may result in the
 - Introduction of the pathogens during lens insertion and inoculation of the organisms to the ocular surface and the lens.
 - Microbial contamination of storage cases.
 - Bacterial biofilm formation may prolong the retention time of organisms at the ocular surface.
- Lim C, Carnt N, Farook M, Lam J, Tan D, Mehta J, et al. Risk factors for contact lens-related microbial keratitis in Singapore. Eye 2016;30:447-455.
- Stapleton F, Naduvilath T, Keay L, Radford C, Dart J, Edwards K, et al. Risk factors and causative organisms in microbial keratitis in daily disposable contact lens wear. PLoS One 2017;12:e0181343.
- Lim C, Carnt N, Farook M, Lam J, Tan D, Mehta J, et al. Risk factors for contact lens-related microbial keratitis in Singapore. Eye 2016;30:447-455.
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Discussion

- The hand skin harbors mainly two types of microorganisms: resident versus transient flora.
- The resident flora (mostly staphylococci) has a low pathogenic potential.
- On the other hand, the transient flora (typically *Escherichia coli*, *Pseudomonas aeruginosa*) has a short-term survival rate, but with a high pathogenic potential.
- The aim of hand hygiene is to decrease hand colonization with transient flora.

• Hugonnet S, Pittet D. Hand hygiene—beliefs or science? *Clinical microbiology and infection*. 2000;6:348-354.

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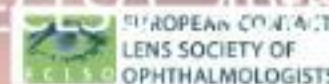
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Discussion

- Hand washing provides physical removal of pathogens.
- Duration of hand washing should be at least 20–30 s
- Soaps facilitate the removal of pathogens and interact with the lipid membranes of microorganisms and inactivate them.

- Hugonnet S, Pittet D. Hand hygiene—beliefs or science? *Clinical microbiology and infection* 2000;8:348-354.
- Coiffa d L, Coureau C. Soap and syndets: Differences and analogies, sources of great confusion. *Eur Rev Med Pharmacol Sci* 2020;24:11432-11439.

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Discussion

- Different types of hand washing products are available, usually all named as soap.
- The traditional soap is obtained through the reaction of saponification. They are organic and natural.
- Syndets, are much more recent and have been in use for about a century. They are synthetic/ chemical detergents, have wider range of additives.

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Discussion

- Soaps can be categorized into 5 group:
 - Toilet soap (Traditional bar soap)
 - Lipid-enriched cleansing bar
 - Liquid soap: Traditional soap or syndets
 - Antiseptic soaps (Liquid syndets with an added antiseptic agent)



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Discussion

- However, even after handwashing, approximately 80% of individuals retain some pathogenic bacteria on their hands.

- Tambekar DH, Shirsat SD, Suradkar SB, Rajankar PN, Banginwar YS. Prevention of transmission of infectious disease: studies on hand hygiene in health-care among students. Continental J Biomed Sci 2007;1:6-10

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Discussion

- Both bar soaps and liquid soaps can be contaminated intrinsically during the manufacture or extrinsically during use, particularly by gram-negative bacteria
- Staphylococci are isolated more often from bar soaps.
- Gram-negative bacteria are isolated mostly from liquid soaps.

- Brooks SE, Walczak MA, Malcolm S, Hameed R. Intrinsic *Klebsiella pneumoniae* contamination of liquid germicidal hand soap containing chlorhexidine. *Infection Control & Hospital Epidemiology* 2004;25:883-885.
- Archibald LK, Cori A, Shah B, Schulte M, Arduino MJ, Agüero S, et al. Serratia marcescens outbreak associated with extrinsic contamination of 1% chlorxylenol soap. *Infection Control & Hospital Epidemiology* 1997;18:704-709.
- McBride ME. Microbial flora of in-use soap products. *Appl Environ Microbiol* 1984;48:338-341.



Discussion

- Bulk-soap-refillable dispensers are prone to extrinsic bacterial contamination especially gram negative bacteria.



- Amemiya, K., and F. Taguchi. 1992. Survey of bacterial contamination of hand washing liquids. *J. Antibacterial Antifungal Agents* 20:459-463.
- Boyce, J. M., and D. Pittet. 2002. Guideline for hand hygiene in health-care settings: Recommendations of the healthcare infection control practices advisory committee and the HICPAC/SHEA/APIC/IDSA hand hygiene task force. *Society for Healthcare Epidemiology of America/Association for Professionals in Infection Control/Infectious Diseases Society of America. M. & V.R. Recomm. Rep.* 51:1-45.

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Discussion

- The reasons for the low number of infections in the bar soap group in our study may be:
 - ❑ Moisturizers are often added to liquid soaps, so if not rinsed completely, they can leave a film on the lenses that leads to keratitis.
 - ❑ The friction created by rubbing the bar soap against the hand can be more effective at removing pathogens.
 - ❑ Contaminated liquid soap and containers might be the cause of high infection rate.

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Discussion

- In this study also infection rate was found to be lower in high school students.
- This age group lives with their family and may be reinforced good contact lens hygiene practices by their parents.

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Discussion

- The limitation of our study is the small sample size and the presented data is reported by the participants themselves.

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Discussion

- Thank you for your patience.