The Prevalence, Types and Risk Factors of Soft Contact Lens-Related Dry Eye

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Poster number

Objectives
• To report prevalence, types, and associated factors of soft contact lens related dry eye

Methods
• Patients wearing *soft CL* were consecutively enrolled

Inclusion Criteria	Exclusion Criteria

• ≥ 18-year-old <u>AND</u>
• Wearing soft CL
  ≥ 5 days/wk <u>AND</u>
  ≥ 1 year
	• Infectious keratitis within 6 months
	• Active giant papillary conjunctivitis
	• Abnormal lid anatomy
	• Ocular surgery within 6 months
	• Using eye drops (except tears)
	• Medication affected tear secretion
	• Autoimmune disease

• *OSDI questionnaire* (score >25) were used to indicate dry eye
• Types of dry eye were evaluated by Schirmer I test, tear film lipid layer thickness, meibography, meibum quality and expressibility scores
• Classifications included aqueous deficiency, evaporative or mixed type
• Associated factors of dry eye were assessed using multivariate analysis

Table 1 Demographic data

		Dry eye (%) n=116 (54.2)	Non-dry eye (%) n=89 (45.8)	Total (%) n=214 (100)	p value*
Female		100 (89.4)	65 (75.6)	165 (77)	0.001
Age, yr		26.1 ± 6.5	26.9 ± 6.3	26.4 ± 6.4	NS
Duration, yr		7.0 (1-22)	7.5 (1-25)	7.5 (1-25)	NS
Schedule, hr/day		11.7 ± 3.0	11.0 ± 2.4	11.4 ± 2.8	NS
CL type	Daily	9 (7.8)	20 (20.4)	29 (13.6)	
	Weekly	6 (5.2)	12 (12.2)	18 (8.4)	0.002
	Monthly	101 (87)	66 (67.4)	167 (78)	
Tears use , day/wk	0	44 (37.9)	43 (43.9)	87 (40.6)	
	1	19 (16.4)	15 (15.3)	34 (15.9)	
	2	14 (12.1)	11 (11.2)	25 (11.7)	NS
	3	16 (13.8)	13 (13.3)	29 (13.6)	
	≥4	23 (19.8)	16 (16.3)	39 (18.2)	
OSDI		43.9 ± 11.9	16.4 ± 7.3	31.3 ± 17.0	-

*p value calculated by T-test or Chi-Square test
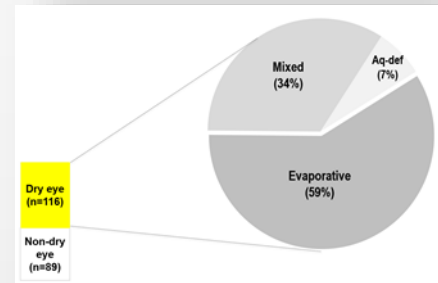p value < 0.05, considered significant,
NS: non-significant

Dry eye (n=116)
Non-dry eye (n=89)

Mixed (34%)
Aq-def (7%)
Evaporative (59%)

CL Wearers (Dec 2015 - Nov 2016)
OSDI score
≤ 25 → Normal
> 25 → Dry Eye
1. Tear film lipid layer thickness (LipiView®)
2. Meibography (OCULUS Keratograph® 5M)
3. Schirmer I test
4. Meibum quality & expressibility score

Aqueous deficient type
• Schirmer I < 5mm
• Meibum quality score < 2
• Meibum expressibility score 0
• Lipid layer thickness > 75nm

Evaporative type
• Schirmer I > 5mm
• Meibum quality score > 2
• Meibum expressibility score > 0
• Lipid layer thickness < 75nm

Mixed type
• Schirmer I < 5mm
• Meibum quality score > 2
• Meibum expressibility score > 0
• Lipid layer thickness < 75nm

Table 2 Dry eye characteristics

	Aq-def (7%)	Evaporative (59%)	Mixed (34%)
Schirmer I, mm	4.1 ± 1.1	12.2 ± 6.0	5.2 ± 4.3
Lipid layer thickness, nm	91.3 ± 10.4	51.0 ± 19.4	68.6 ± 22.6
Meibomian gland dropout, %	5.4 (0-12.2)	22.6 (7.6-31.4)	15.1 (5.7-30.3)
Meibum quality score	0 (0-1)	4 (0-18)	4 (0-16)
Meibum expressibility score	0 (0-0)	1 (0-2)	1 (0-2)
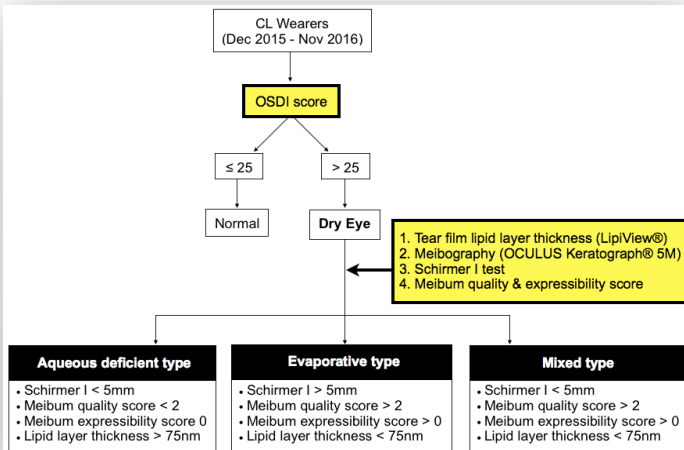
Results
• A total of 214 subjects were enrolled (77% female, age 26.4 ± 6.4 years, wearing CL for 7.5 (1-25) years and 11.4 ± 2.8 hours/day)
• *Dry eye prevalence was 54.2%* with OSDI score 43.9 ± 11.9
• In dry eye group, female was predominant (p=0.001) and the majority used monthly wear CL (p=0.002)
• Associated factors of dry eye were female sex (OR 3.06, 95%CI 1.54-6.11, p=0.001) and monthly wear CL (OR 3.25, 95%CI 1.37-7.72, p=0.08)

• *Evaporative type was the most common (59%)* with average ICU score 51.0 ± 19.4 and % gland dropout 22.6% (7.6-31.4), followed by mixed type (34%) and aqueous deficiency type (7%) which had Schirmer I value 4.1 ± 1.1 mm.

Conclusion
• Dry eye was the most concerning issues before prescribing CL. More than half of soft CL wearers could develop dry eye, mainly evaporative type. It was necessary to educate patients about this burden, especially for women and monthly CL wearers.