ASCRS·ASOA SYMPOSIUM & CONGRESS 2014 APRIL 25–29 BOSTON

BIOMETRIC RISK FACTORS INVOLVED IN CORNEAL SURFACE COMPLICATIONS WITH SOFT CONTACT LENS WEAR

Dae Seung Lee, MD[1]
Mee Kum Kim, MD, PhD[1]
Won Ryang Wee, MD, PhD[1]

[1]Department of Ophthalmology, Seoul National University Hospital

The authors have no financial interests to disclosure.

Background

ASCRS·ASOA SYMPOSIUM & CONGRESS 2014 APRIL 25–29 BOSTON

- Contact lens related problems
  - infectious keratitis,
  - superficial corneal keratitis,
  - Neovascularization, etc

Jones et al. 2001.
Markoulli et al. 2012.
Teo et al. 2011.

- Risk factors
  - lens care system, contact lens material
  - durability, spoilage characteristics of the lens
  - wear schedule, lens power,
  - contact lens solution, overnight wear,
  - and patient related factors such as smoking

Chalmers et al. 2011.
Dart et al. 2008.
Nichols et al. 2011.
Ozkan et al. 2010.
Ramamoorthy et al. 2008.
Richdale et al. 2007.
Stapleton et al. 2012.

- However, **Corneal biometric risk factors** have not been fully determined so far.

Purpose

ASCRS·ASOA SYMPOSIUM & CONGRESS 2014 APRIL 25–29 BOSTON

- To investigate the biometric risk factors involved in corneal surface complications in fitting hydrogel soft contact lenses (SCLs) in myopic patients in Korea.

Methods

ASCRS·ASOA SYMPOSIUM & CONGRESS 2014 APRIL 25–29 BOSTON

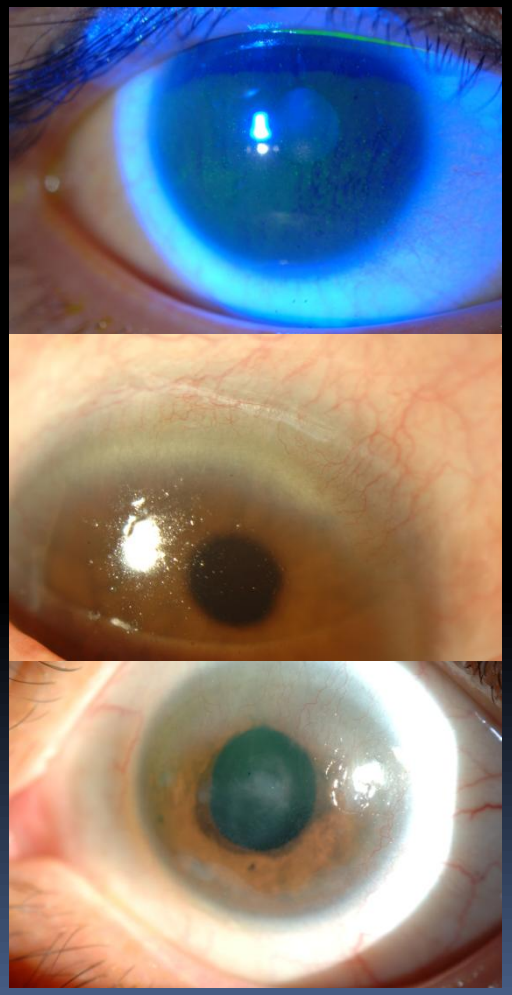
- age- and sex-matched and case-controlled design
- retrospective review of medical records

- Participants
  - Complication group : 40 patients (80 eyes)
    - Diagnosed with
      - focal limbal cell deficiency, corneal neovascularization, superficial punctate keratitis
  - Control group : 84 patients (168 eyes)
  - Between January 2008 and April 2011

Methods

ASCRS·ASOA SYMPOSIUM & CONGRESS 2014 APRIL 25–29 BOSTON

- Superficial punctate keratitis
  - Higher than NEI scale 3
- Corneal neovascularization
- Focal limbal insufficiency
  - Neovascularization,
  - surrounding conjunctival edema,
  - overlying limbal superficial punctate erosion



Methods

ASCRS·ASOA SYMPOSIUM & CONGRESS 2014 APRIL 25–29 BOSTON

- Orbscan topography
  - (Bausch & Lomb, Rochester, USA)
  - Temporary corneal warpage
    - 3.0 Dioptor or higher irregularity index within a 3-mm zone
- Ultrasound pachymetry
  - (Quantel medical, Clermont-Ferrand, France)
  - Corneal central thickness
- Automated keratometry
  - (Topcon KR-8900, Tokyo, Japan)
  - Astigmatism, spherical equivalent

Results

ASCRS·ASOA SYMPOSIUM & CONGRESS 2014 APRIL 25–29 BOSTON

Table 1. Demographics of the enrolled patients

	Control (n=168)	Complication (n=80)	P-value
Age (year) †	28.8±7.8	29.9±10.6	0.363
Sex (M:F) *	36:132	16:64	0.796
BCVA (logMAR) †	0.006±0.146	0.089±0.177	<0.001
Duration (year) †	7.15±5.26	8.39±7.45	0.183
Spherical equivalent (D) †	-5.88±3.14	-7.93±5.04	<0.001
Astigmatism (D) †	1.15±0.86	1.36±1.25	0.142
Pachymetry (mm) †	0.537±0.035	0.546±0.035	0.055
Base curve radius (mm) †	7.69±0.26	7.68±0.29	0.788
3 mm irregularity index †	1.35±0.45	2.05±2.81	0.002

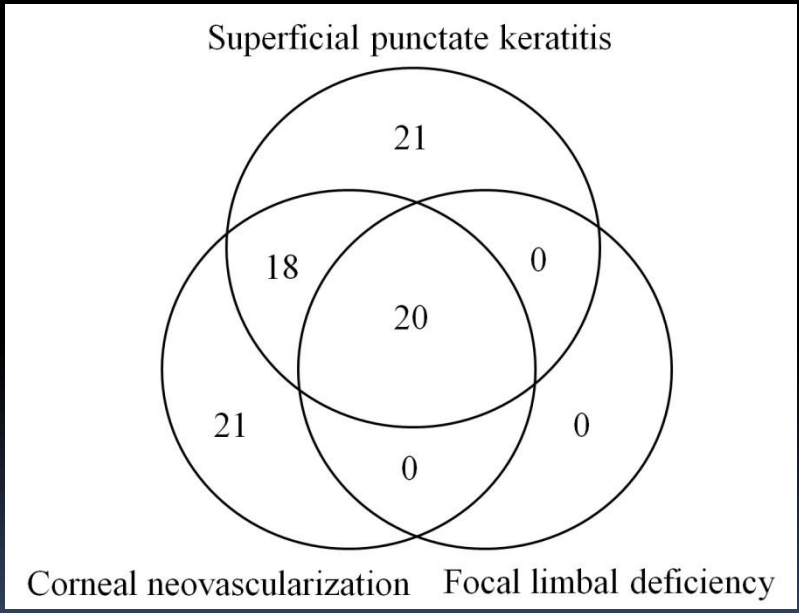
*Categorical outcomes were compared using Fisher's exact test.
†Continuous outcomes were compared using independent t-test.

Results

Table 2. The patients with variable corneal surface complications in complication group

Total (N=80)	Frequency (%)
Superficial punctuate Keratitis	72.8
Corneal neovascularization	72.8
Focal Limbal deficiency	25.0
Corneal warpage	27.5

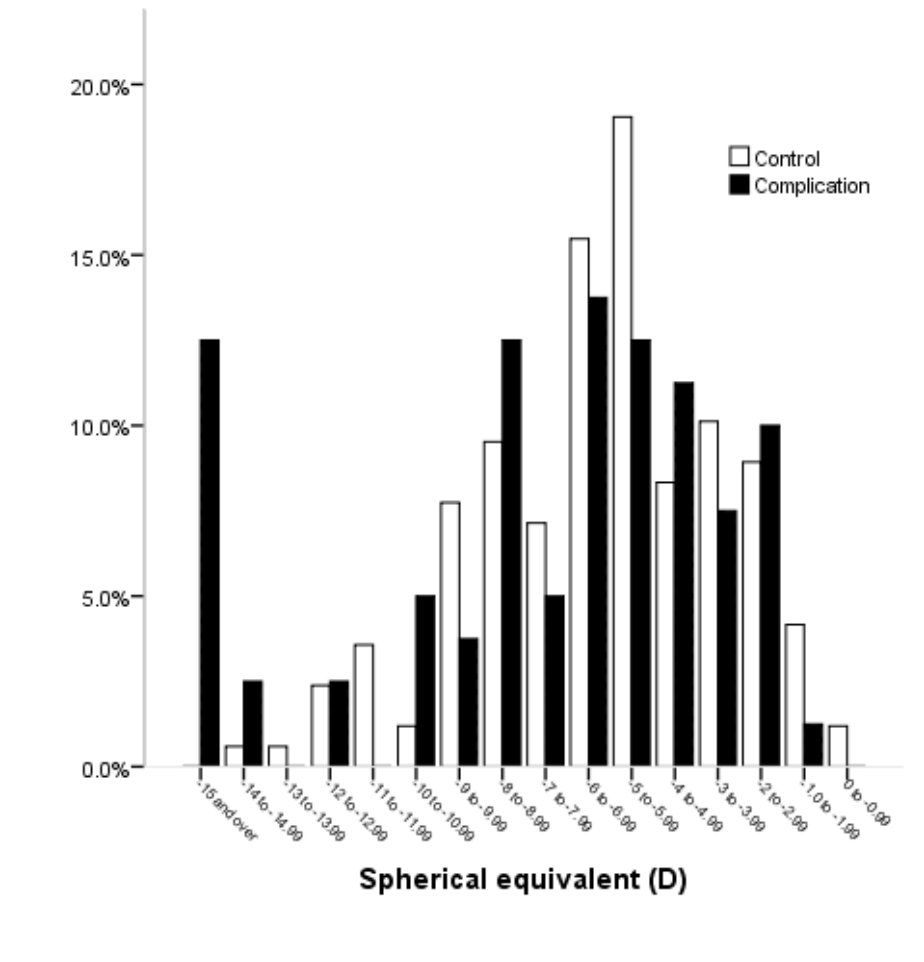
Figure 1. distribution of the surface complications in complication group.



Results

ASCRS·ASOA SYMPOSIUM & CONGRESS 2014 APRIL 25–29 BOSTON

Figure2. The frequency distribution of spherical equivalent for the SCL wearers between control group and complication group.

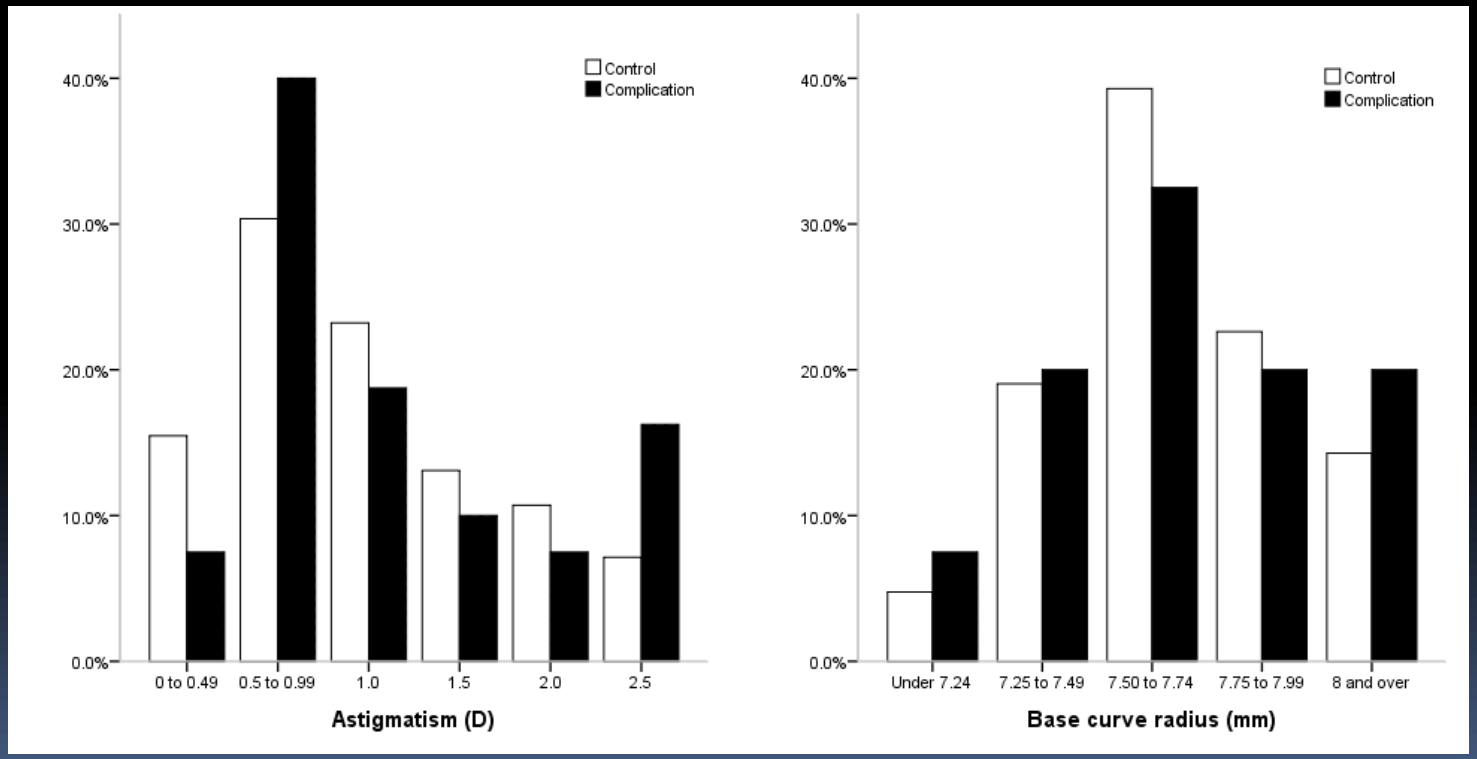


*D = Diopter

Results

ASCRS·ASOA SYMPOSIUM & CONGRESS 2014 APRIL 25–29 BOSTON

Figure3. The frequency distribution of astigmatism and base curve radius for the SCL wearers between control group and complication group.



*D = Diopter

Results

ASCRS·ASOA SYMPOSIUM & CONGRESS 2014 APRIL 25–29 BOSTON

Table2. Results of an univariate and multivariate analysis of risk factors of corneal surface complications

	univariate model			multivariate model		
	OR	95% CI	P	adjusted OR	95% CI	P
sphrical equivalent ≤-9.5 or >-9.5 D	2.60	1.28-5.28	**0.008**	2.14	1.01-4.56	**0.048**
astigmatism ≥2.5 or <2.5 D	2.52	1.09-5.82	0.030	1.76	0.71-4.34	0.221
base curve radius < 7.40 mm or ≥7.40 mm	2.22	1.06-4.67	0.035	1.95	0.91-4.21	0.087

*D = Diopter

Conclusion

ASCRS·ASOA SYMPOSIUM & CONGRESS 2014 APRIL 25–29 BOSTON

- **High myopia higher than 9.5 Diopter** seemed to be most significant risk factor in the development of corneal surface complications in SCL wearers.