CONTACT LENS INDUCED PAPILLARY CONJUNCTIVITIS: A CASE CONTROL STUDY

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Purpose

To investigate pre-disposing risk factors associated with developing localised CLPC with high Dk silicone hydrogel extended wear (EW) lenses.

Materials and Methods

Study Design:

- Restrospective case control analysis
- Subjects matched for spectacle refraction, duration of high Dk soft contact lenses EW, prescribed wearing schedules (6 or 30 nights) and lens type.
- Tarsal conjunctiva divided into five zones to grade redness and roughness (Figure 1).

Lenses	Type A	Type B
Material	Balafilcon A	Lotrafilcon A
Water content (%)	35	24
Dk (barrers)	110	140
Modulus (Mpa)	1.1	1.2

Signs and Symptoms of CLPC:

- Itching, worsens during the day or duration in lens wear
- Excessive movement/ lens discomfort
- Blurred vision due to lens mislocation
- Raised papillae localised to a confined area (Figures 2 & 3)
- Hyperaemia corresponding to regions of papillae
- Mucus strands observed in tear film
- Lens coated with mucus / deposits

Variables Compared:

- Subjective characteristics - (baseline: keratometry, allergy history)
- Clinical characteristics - cases vs controls at baseline and including all visits in EW prior to the event

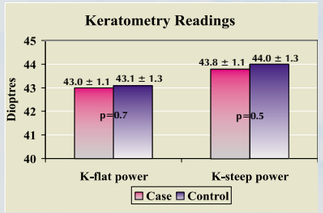
Clinical Characteristics:

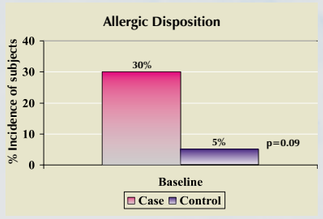
Biomicroscopy	Surface Characteristics	Lens Performance
Tarsal conjunctival roughness (0-4)	Wettability (0-5)	Tightness (1-100%)
Tarsal conjunctival hyperaemia (0-4)	Front surface deposits (0-4)	Primary gaze movement
Bulbar hyperaemia (0-4)	Back surface deposits (0-4)	
Meibomian gland appearance (0-3) (See Figure 4)	Tear film debris (0-4)	
Blepharitis (0-4)		

Results

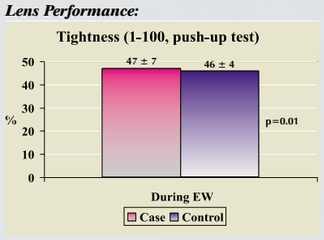
Subject Characteristics:

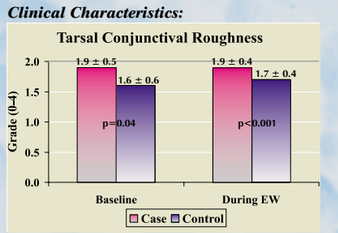
	Cases (n=20)	Controls (n=20)	p-Value
Age (yrs) Range	34 ± 7 (21 to 49)	33 ± 6 (23 to 46)	0.5
Sex (M:F)	10:10	6:14	0.3
Rx - Sphere (DS) Range	-2.56 ± 0.90 (-1.00 to -4.75)	-2.81 ± 1.20 (-1.50 to -6.50)	0.3
- Cyl (DC) Range	-0.30 ± 0.30 (0.00 to -1.00)	-0.30 ± 0.40 (0.00 to -1.50)	0.9
Length of EW (mths) Range	11.7 ± 4 (6 to 21)	14.5 ± 5 (6 to 21)	0.06
Wear schedule (6N:30N)	7:13	7:13	1.0

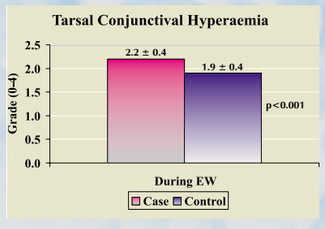


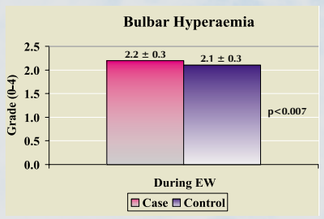


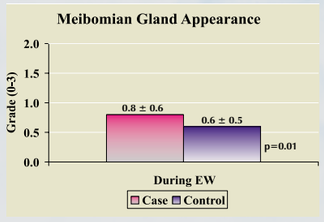
Lens Performance:











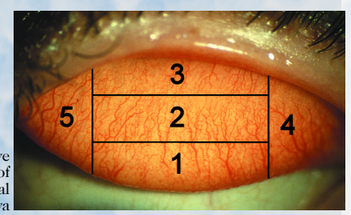


Figure 1: Five zones of tarsal conjunctiva

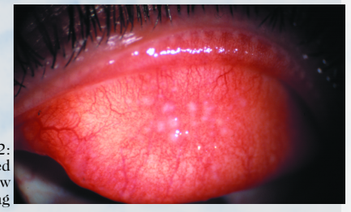


Figure 2: Localised CLPC low mag

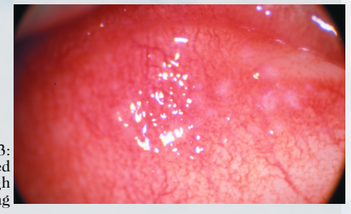


Figure 3: Localised CLPC high mag

Figure 4: Meibomian glands

Discussion

Summary	
SIGNIFICANT	NON-SIGNIFICANT
Baseline	
Increased mean tarsal conjunctival roughness	Keratometry
Greater incidence of allergy	
Case vs Controls (During EW)	
Increased mean tarsal conjunctival roughness	Blepharitis
Increased mean tarsal conjunctival hyperaemia	Front surface deposits
Increased mean bulbar hyperaemia	Back surface deposits
Greater lack of patency of meibomian orifices	Wettability before event
Tighter fitting lens	Tear film debris
	Primary gaze movement

It is postulated that the mechanical interaction of the lens design, lens edge or modulus and the lid ocular surface may play an important role in the pathogenesis and aetiology of localised CLPC. In addition, frictional forces exerted by the upper tarsus on the lens causes excessive drag during blinking. Patients with an atopic history are more prone to develop CLPC[3]. Discontinuations of lens wear until full resolution and redispensing the patient with a new lens (or a different lens material), decrease in wear time and/or frequent replacement may prevent recurrences. However, 50% of patients will possibly develop recurrences in the same high Dk lens material.

Conclusion

Pre-disposing risk factors associated with developing localised CLPC have been identified:

- Patients with a predisposition to allergies are more likely to develop CLPC, whether it be localised or generalised.
- Subjects with increased tarsal conjunctival roughness, tarsal conjunctival hyperaemia and bulbar hyperaemia,
- Tighter fitting lenses and a lack of patency of meibomian orifices.

References

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