Contact Lens - Ocular Surface Interactions in Superior Epithelial Arcuate Lesions (SEALS)

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Purpose
Determine ocular and lens surface and fitting factors associated with superior epithelial arcuate lesions (SEALS) in high Dk soft extended wear (EW).

Method

SEALS: Signs and Symptoms
- Full thickness epithelial split
- Typically between 10 and 2 o’clock and within 3mm of limbus.
- Occurs at any time of day.
- Epithelial cells accumulate (DeMoura, 1985).
- Tightly fitting lenses
- Higher numbers of corneal epithelial cells
- Usually asymptomatic but sometimes “foreign body” sensation reported.

STUDY DESIGN
- Retrospective analysis
- Subjects matched for age, sex, spectacle refraction, duration of high Dk soft EW, prescribed wearing schedule (6 or 30 nights) and lens type.
- Variables compared:
  - Subject characteristics (baseline keratometry, ethnicity)*
  - Lens surface characteristics (wettability, back surface “film”, front surface debris, mucin balls)**
  - Lens performance (tightness, primary gaze movement)**

*At baseline only
**Visits prior to event for cases vs control and visits at time of event for cases

Contact lens cytology
- Performed at follow up visit (not during event)
- Habitual lenses removed directly from the cornea
- Epithelial cells harvested from the back surface of the lens by irrigation
- Irrigated cells and lens stained with 2mg/ml Hoescht 33342 stain with 10mg/ml Propidium Iodine for 10 mins at 37°C
- Cells filtered, mounted and viewed under fluorescent microscopy
- Cell counts and viability compared between cases and controls for total counts, loosely adherent cells (collected from the lens irrigation) and tightly bound cells (those remaining attached to the lens)

Cases vs control: comparison between the 2 groups.

Cases of event
Cases prior to event
Control

<table>
<thead>
<tr>
<th>Subject Characteristics</th>
<th>Cases (n=6)</th>
<th>Controls (n=15)</th>
<th>pValue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>30 ± 4</td>
<td>30 ± 4</td>
<td>0.6</td>
</tr>
<tr>
<td>Sex (M:F)</td>
<td>10:10</td>
<td>10:10</td>
<td>1.0</td>
</tr>
<tr>
<td>Rx-Spheres (DS) - Cyl (DC)</td>
<td>-2.73 ± 1.07</td>
<td>-2.66 ± 1.16</td>
<td>0.9</td>
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<tr>
<td>Length of EW (mths)</td>
<td>19 ± 7</td>
<td>19 ± 6</td>
<td>0.7</td>
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</tbody>
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Wettability (0-5, 0.1)

Tightness (% 1-100 push up test)

Surface Characteristics

Total (live and dead) cell counts

Contact Lens Performance

Contact Lens Cytology

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Lenses worn by cases recovered more cells than controls.

Cases recovered total and adherent cell counts in lenses worn.

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References