OVERNIGHT CORNEAL SWELLING WITH A SILICONE-HYDROGEL (BALAFILCON A) TORIC LENS

Noel A Brennan PhD, M-L Chantal Coles OD
Brennan Consultants Pty Ltd, Melbourne, Australia

Introduction

- Overnight corneal swelling is regarded as a key indicator of the physiological acceptability of a contact lens.\(^1\)\(^2\)
- Spherical silicone-hydrogel lenses approved internationally for continuous wear produce on average less than 4% overnight swelling,\(^1\) which is within the range commonly encountered without a contact lens in place.\(^1\)\(^4\)
- Bausch & Lomb have manufactured a toric contact lens made from a silicone-hydrogel material (balafilcon A).
- The aim of this study was to measure the overnight corneal swelling produced with this toric lens.

Methods

- The protocol was approved by Melbourne Ocular Science & Technology enterprises Human Research Ethics Committee.
- A total of 23 subjects were enrolled in this study after the nature of the procedures was fully explained.
- Contact lenses were worn for a minimum of 8 hours overnight at our premises.
- Central corneal thickness (CCT) was measured with the Orbscan before and after sleep.
- 20 subjects wore a balafilcon A toric lens (PUREVISION™ Toric, Bausch & Lomb) in one eye and a balafilcon A spherical lens (PUREVISION™ Toric, Bausch & Lomb) in the other eye.
- 20 subjects wore a balafilcon A toric lens in one eye and a etafilcon A toric lens (ACUVUE® TORIC, Vistakon) in the other eye.

Results

<table>
<thead>
<tr>
<th>CCT before (µm)</th>
<th>CCT after (µm)</th>
<th>EDEMA (%)</th>
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<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
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</table>
| PHASE 1
Balafilcon A toric | 536 | 30 | 3.4 | 557 | 57 | 3.3 | 1.94 | 2.0 |
Balafilcon A spherical | 534 | 56 | 3.7 | 555 | 60 | 2.9 | 1.85 | 2.1 |
| PHASE 2
Balafilcon A toric | 538 | 49 | 3.4 | 562 | 58 | 3.6 | 4.37 | 2.6 |
Balafilcon A toric | 539 | 49 | 3.1 | 591 | 45 | 3.1 | 9.91 | 4.8 |

Discussion

- The balafilcon A toric induced swelling of approximately the same amount as the balafilcon A spherical lens across the corneal topography.
- This similarity of swelling occurs despite a different thickness profile (see Fig 5). This may be due to a limbal compression effect, average lens thickness effects, limbal oxygen supply or insensitivity of the measurement equipment.
- The balafilcon A toric induced considerably less swelling than the etafilcon A toric lens which is one of the better physiologically performed hydrogel toric lenses.\(^9\)

References


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