MUCIN BALL POST-LENS DEBRIS IN HIGH Dk SILICONE HYDROGEL WEARERS

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Introduction

Experience with high Dk silicone hydrogel lenses indicates that some subjects are prone to the development of a unique form of tear-film derived debris between the back surface of these lenses and the corneal epithelium.

This translucent debris (so-called “mucin balls”) commonly occurs after overnight wear, forming as a number of spherical bodies between the cornea and back surface of the lens. The size of the debris particles ranges from 20 to 200 μm.

Following lens removal, the mucin balls are easily blinked away, leaving depressions or imprints on the ocular surface (Figure 1), which display unversed illumination.

These imprints are more visible when fluorescein is instilled into the eye due to accumulation of fluorescein within the depression (Figure 2). There is no fluorescein penetration into the epithelium.

Little information is known about these spherical bodies, particularly in respect of their incidence, time to develop and any associated complications.

Materials & Methods

Subjects: 92 myopic subjects wore a pair of Lotrafilcon A lenses (Focus Night & Day) on an overnight basis for up to 6 nights (n=30) or up to 30 nights (n=62).

Visits: subjects were evaluated at dispensing and after 1, 3 and 6 months.

Mucin ball observations: a 0.4 severity grading scale in 0.5 increments was developed, in which a greater number represented a greater mucin ball response. This scale is graphically represented in Figure 3.

Pre-lens non-invasive tear break-up time (NIBUT - Tearscope), biomicroscopic response, subjective responses, and lubricant-drop usage were recorded throughout the period of the study.

Results

Incidences: Figure 4 indicates that 70% of subjects exhibited mucin balls: 41% exhibited them on 1 or 2 of the visits and 29% exhibited them at each of the 3 visits.

Severity: Figure 5 indicates that almost 50% of eyes did not exhibit mucin balls at any visit and mucin balls were graded at > grade 1 in 18% of eyes, > grade 2 in 4% of eyes and > grade 3 in 1% of eyes.

Concordance: There was a 71% concordance between eyes. Therefore, the following results represent data from the right eye only.

Association with biomicroscopic appearance: Figure 8 represents the percentage of subjects with biomicroscopic findings > 2 (0-4 scale) at the 6 month visit and indicates that there was no association between biomicroscopic response and mucin ball observation (p>NS). This was also the case at the 1 and 3 month visits.

Subjective ratings: Table 1 shows mean subjective ratings by mucin ball appearance. With the exception of handling on removal, the presence of mucin balls does not affect subjective ratings.

Conclusions

Approximately one-third of all subjects exhibit mucin balls at all visits with Lotrafilcon A lenses.

Only 5% of subjects demonstrate a clinically significant degree of mucin ball debris.

The presence of mucin balls does not appear to be detrimental to contact lens wear.

Future investigation into the relationship between mucin ball observation and the use of rewetting drops is warranted.

Acknowledgement

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Table 1 - Mean Subjective Ratings by Visit

<table>
<thead>
<tr>
<th>Visits</th>
<th>Mucin Balls</th>
<th>No Mucin Balls</th>
<th>1 month</th>
<th>3 months</th>
<th>6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 month</td>
<td>9.2</td>
<td>8.8</td>
<td>9.0</td>
<td>9.3</td>
<td>9.0</td>
</tr>
<tr>
<td>3 months</td>
<td>9.2</td>
<td>8.8</td>
<td>9.3</td>
<td>9.5</td>
<td>9.3</td>
</tr>
<tr>
<td>6 months</td>
<td>9.2</td>
<td>8.8</td>
<td>9.3</td>
<td>9.5</td>
<td>9.3</td>
</tr>
</tbody>
</table>

100% p = 0.04, p = 0.029 (higher rating in subjects with mucin balls)

Figure 9 shows that there were no significant differences in overall satisfaction between the subjects with and without mucin balls (p = 0.27, 0.27, 0.48).

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