Clinical performance of a peroxide-based care system and a multi-purpose care system formulated for use with silicone hydrogels

N Keir, S Schneider, K Dumbleton, CA Woods, Y Feng
Centre for Contact Lens Research, School of Optometry, University of Waterloo, Ontario, Canada

Introduction

Silicone hydrogel (SH) lenses have dramatically reduced lens-induced hypoxia in comparison to hydrogel lenses1,2 and are quickly becoming the daily wear lens of choice for many practitioners.3

Multipurpose solutions are used due to their convenience and low cost,4 while hydrogen peroxide care systems are often recommended for the management of lens-solution incompatibilities.5 Due to the unique characteristics of SH lens materials, many lens care systems are being reformulated in order to improve their compatibility and effectiveness.

While studies continue to report less corneal staining with peroxide-based lens care systems compared to certain multi-purpose lens care systems,6,7 there have been few studies comparing comfort (including comfort wearable time (CWT)) and patient preference between these two options.

Purpose

To investigate the clinical performance of a peroxide-based lens care system (CIBA Vision, Clear Care) and a multi-purpose lens care system (Alcon, OPTI-FREE RepleniSH) which has been formulated for use with SH lenses.

Methods

Randomized, single-masked (clinician)

<table>
<thead>
<tr>
<th>Contralateral eye (lens material)</th>
<th>Peroxide-based care system (Clear Care)</th>
<th>Multi-purpose care system (OPTI-FREE RepleniSH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrafilcon B – O2</td>
<td>Lens pair 1 with 1st solution Jake (lenses replaced q 2wks)</td>
<td>Lens pair 2 with 2nd solution Jake (lenses replaced q 2wks)</td>
</tr>
<tr>
<td>Intrafilcon A – OA</td>
<td>Intrafilcon A – OA</td>
<td>Intrafilcon A – OA</td>
</tr>
<tr>
<td>Crossover (care system)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Subject Characteristics: 26 subjects were enrolled in the study and 2 were discontinued. Results are reported for 24 subjects (see table below). Discontinuations were due to: 1) redness and discomfort while using RepleniSH and 2) test lens pairs.

Clinical variables

Clear Care RepleniSH OA

Weñerbility (grade = perfect; 4=severely reduced) 1.08 ± 0.2 1.04 ± 0.2 1.42 ± 1.0 0.95 ± 0.7

Deposits (grade = none; 4=severe) 0.33 ± 0.1 0.38 ± 0.1 0.60 ± 0.7 0.33 ± 0.5

PL NITELT (seconds) 5.90 ± 0.4 8.52 ± 0.4 7.58 ± 0.5 6.18 ± 0.5

Conical microscopy (peripheral basal cell density per mm²) 4794 ± 193 4868 ± 269 4904 ± 274 4899 ± 270

Epithelial/permellulosity (mm/sec/20x) 0.046 ± 0.01 0.087 ± 0.01 0.052 ± 0.01 0.058 ± 0.01

Conjunctival staining (0=none; 4=severe) 0.79 ± 0.1 0.69 ± 0.1 1.04 ± 0.1 1.23 ± 0.2

(non-solution sensitivity) corneal staining* 0.52 ± 0.2 0.48 ± 0.1 0.35 ± 0.1 0.60 ± 0.1

*One subject developed bilateral corneal staining that met the description used for “solution sensitivity” staining in the study (multilocular staining in 3 peripheral corneal quadrants) while using RepleniSH.

The hours of CWT were reported by phone in the evening to increase reliability and avoid missing data. Results are shown, with statistically significant differences marked. Overall, Clear Care resulted in a longer CWT, regardless of lens type. As clinical variables and subjective ratings do not always manifest what patients actually experience, CWT may prove to be a better assessment of lens comfort and long term predictor of success.

Slightly better graded wettability and fewer visible deposits seen on OA with RepleniSH were not associated with a longer CWT or better ratings, suggesting that these investigator assessed measures do not predict comfort.

With the exception of one subject exhibiting corneal staining which was consistent with a solution sensitivity (with RepleniSH), both Clear Care and RepleniSH were compatible with the SH lens materials used in this study.

Results from the preference and exit questionnaires suggest that a peroxide-based care system is a viable first choice lens care option for SH lenses.

References


Exit questionnaire

After using Clear Care I can’t feel that I’m wearing my lenses

Strongly agree Somewhat agree Neutral Somewhat disagree Strongly disagree

Clear Care cleans my lenses better than the other solution I used during the study

Clear Care is easy to use

RepleniSH

Overall, Clear Care is superior to the other solution I used during the study

Overall, Clear Care is superior to the other solution I used during the study

Total Responses

A study exit questionnaire was completed, which asked subjects whether they agreed to various statements. Responses that were statistically significant are marked in red (p<0.05). The results show that subjects agreed that Clear Care made their lenses feel comfortable, cleaned their lenses better than RepleniSH and was easy to use.

Discussion

This study demonstrated that Clear Care resulted in a longer CWT, regardless of lens type. As clinical variables and subjective ratings do not always manifest what patients actually experience, CWT may prove to be a better assessment of lens comfort and long term predictor of success.

Slightly better graded wettability and fewer visible deposits seen on OA with RepleniSH were not associated with a longer CWT or better ratings, suggesting that these investigator assessed measures do not predict comfort.

With the exception of one subject exhibiting corneal staining which was consistent with a solution sensitivity (with RepleniSH), both Clear Care and RepleniSH were compatible with the SH lens materials used in this study.

Results from the preference and exit questionnaires suggest that a peroxide-based care system is a viable first choice lens care option for SH lenses.