

NCC 'Beyond 2020' Paper Abstracts
Free paper sessions
Monday, March 27, 2022 09:30 – 10:30
Netherlands, Veldhoven, de Koningshof,
Baroniezaal

Organization Section: NCC/ BCLA

Moderator: Marika Martena & James
Wolffsohn

Paper Number: 1

Presentation time: 09:30-09:40

**Evaluation Of The Effectiveness Of A Scl
Indicated For Accommodative Support
On The Symptoms Of Eyestrain And On
The Visual Functions Of Young Adults**

Marika Martena, Giancarlo Montani

Purpose: To evaluate the effects of a soft
contact lens indicated for accommodative
support (Biofinity Energy, CooperVision)
compared to a single vision aspherical
lens (Biofinity, CooperVision) on eyestrain
symptoms and visual functions.

Method: For this prospective, cross-over,
subject-masked study 24 soft cls wearers,
aged between 20 and 35, were enrolled.
The inclusion criteria included a spherical
refractive error between +3.00/-6.00D, an
astigmatism<0,75D and a best corrected
binocular high contrast VA≤0,10 logMar.
The measurements included: VA; The high
order aberrations (HOAs);
Accommodative facility; High frequency
components (HFC) of accommodative
microfluctuations (AMF) (1-2.3Hz); CFF for
yellow, green and red stimuli; Pupillary
diameter of the right eye in conditions of
high mesopic (4.0Lux), low mesopic
(0.40Lux) and scotopic (0.04Lux)
The Italian translated version of CVSS17
validated questionnaire was
administered.

The ANOVA was used to compare the
different variables. To compare the
results obtained using The CVSS17
questionnaire Student's t-test for paired
data was used. A p value of <0.05 was
considered statistically significant.

Results: The subjects had a refractive
error of -2.37±2.88D and an age of
22.8±2.9 years. The baseline binocular VA

value didn't change statistically
significantly (p=0.142) using both lenses.
Statistically significant differences were
found for spherical aberration (p=0.006)
with Biofinity lenses and a significant
negative shift with Biofinity Energy lenses.
Statistically significant differences were
found for the accommodative facility (p
<0.0001) and for AMF (p=0.002).
Analyzing the answers obtained by the
CVSS17 questionnaire during Biofinity
Energy lens wear the symptoms were
significantly lower (p<0.05) compared to
Biofinity lens wear for all questions except
one (C24).

Conclusions: The results show that during
the use of VDT, the use by young adults of
Biofinity Energy compared to Biofinity CL
is able to support the accommodative
functions. The objective data assessed
were also supported by the lower
subjective symptomatology recorded with
this lens.

Research funding received: None

Paper Number: 2

Presentation time: 09:40-09:50

**Predicting Scleral Lens Rotation Based On
Scleral Toricity**

*Langis Michaud, Gabriella Courey, Marie-
Michelle Dupuis, Remy Marcotte-Collard,
Mhamed Ouzzani*

Purpose: Scleral lens orientation becomes
extremely important to maximize vision
and lens stability in patients who are
fitted in front-toric lenses. Current clinical
techniques to determine the rotation of a
scleral lens involve the use of diagnostic
lenses; however, these methods require a
substantial amount of chair time to
achieve an optimal fit. Contemporary
equipment exists to evaluate ocular
surface shape, which could be useful in
predicting scleral lens rotation and
increasing the overall efficiency of scleral
lens adjustments. The goal of this
comparative and randomized study was
to evaluate scleral lens rotation based on
the values provided by two scleral
topographers.

Method: This study was approved by

institutional IRB. Both eyes of each participant were imaged using two scleral topographers: the Eye Surface Profiler (ESP, Eagle Eye) and the Cornea Sclera Profile (CSP, Oculus Pentacam). Participants were fitted with the OneFit MED (L1) on one eye and the Zenlens on the fellow eye (L2). Each lens's rotation was evaluated at the slit lamp and compared to the steep axis of conjunctival astigmatism identified by each topographer, since lenses habitually tend to stabilize over the steep meridian of scleral toricity.

Results: Fifteen subjects (67% F, 21-33 yo, mean 25.13±3.52 years) completed the study. The mean absolute rotation difference between the steep axis reported by the ESP at 15mm and the examiner-observed rotation was 12.42°±16.93 for L1 and 13.93°±17.17 for L2. The mean absolute rotation difference between the steep axis reported by the CSP at 15mm and the examiner-observed rotation was 18.00°±18.68 for L1 and 32.49°±23.57 for L2. A two-way, mixed design ANOVA, with topographer as a between subjects factor and lens as a within subjects factor, yielded a non-significant topographer x lens interaction at a chord of 15mm, $F(1,14)=3.390$, $p=0.087$. Simple main effects conducted between topographer conditions revealed a significant difference between each topographer's ability to predict lens rotation, $F(1,14)=5.437$, $p=0.035$. Simple main effects conducted between lens conditions revealed a non-significant difference between the lenses, $F(1,14)=1.981$, $p=0.181$.

Conclusions: While the rotations from both instruments are not comparable, the ESP predicted rotation within 15° from slit lamp observation, which makes it clinically acceptable for lenses with low values of cylindrical power. Based on this study, the high lens rotation values given by the CSP deem it inefficient for predicting toric scleral lens rotation. The visual acuity of lenses with high amounts of toricity may be affected by the amount

of rotation and are not suitable for empirical fittings at this point in time.

Research funding received: None

Paper Number: 3

Presentation time: 09:50-10:00

Visual quality assessment and comparison of different multifocal scleral lens designs

Juan Gonzalo Carracedo Rodriguez, Ana Privado-Aroco, Gonzalo Valdes Soria, María Romaguera Planells, Maria Serramito Blanco

Purpose: The purpose of this study was to compare the visual quality between a conventional multifocal scleral design (CMS) and decentered-optic multifocal scleral design (DMS).

Method: Fourteen adult patients (52.43±4.07 years) with regular corneas were recruited to participate in this study. All participants were voluntarily involved in the study after signing a written informed consent form, where the purpose and the procedures of the study were explained. The clinical evaluation was carried out at the Optometry Clinic of the Complutense University of Madrid (Spain). Two different multifocal (CMS and DMS) scleral lens designs were fit bilaterally and for each design Dominant-Dominant (DD), Non Dominant-Non Dominant (NDND), Dominant-Non Dominant (DND) and Non Dominant-Dominant (NDD) combinations were randomly evaluated, being the first lens for the sensorial dominant eye. DMS decentration was calculated from the pupillary center. Best corrected visual acuity (BCVA), subjective vision (visual analogue scale) and stereopsis were collected for all lens designs after 45 minutes of lens wear. The values were analyzed and are presented as the mean ±SD. A $p<0.05$ was considered statistically significant.

Results: A statistically significant improvement for distance, intermediate and near vision was obtained with DMS lens (-0.13±0.06; -0.13±0.06 and 0.09±0.16 respectively) in comparison

with CMS (0.11 ± 0.08 ; 0.08 ± 0.07 ; 0.21 ± 0.14) ($p < 0.05$) besides a slightly, but not significant, worsening in stereopsis ($p > 0.05$). Regarding subjective vision, a significant statistical improvement with DMS lens (79.67 ± 7.02) was also found compared with the CMS (67.33 ± 7.63) ($p < 0.05$). Preferred combination for CMS lens was NDND (35.71%) and for DMS was NDD (42.86%), only 35.71% of the participants chose the same combination for both lens designs.

Conclusions: The DMS lens design shows better performance in term of vision quality compared with the CMS. Therefore, it seems to be that DMS lens is a great option for presbyopes.

Research funding received: Supported by CooperVision Specialty EyeCare

Paper Number: 4

Presentation time: 10:00-10:10

Use of an online fitting app to support fitting in practice

David Webley, Petra Zapsky, Alexandre Pétel, Laura Hanenberg, Marcella McParland

Purpose: Eye care professionals (ECPs) report a key barrier to fitting contact lenses (CLs) is time. An online fitting app (OptiExpert™, CooperVision, Inc) has been shown to recommend CL parameters which strongly correlate with study investigator determined powers. To understand whether OptiExpert can help streamline the CL fitting process, and subsequent trial and purchase, a real-world practice investigation looked at whether trial CL specifications pre-selected using OptiExpert are the same as those prescribed by ECPs.

Method: Across 8 optical practices in Germany, patients were offered a CL trial during pre-examination screening. For pre-presbyopes, auto-refraction results were inputted into OptiExpert, and the CL recommendation given to the ECP for the fitting. For presbyopes, refraction was carried out first (rather than auto-refraction), and then the same process followed. Fitting assessment was

undertaken, and purchase rates calculated. Final purchased CL specifications were compared with the OptiExpert pre-selected CL.

Results: 53 patients (mean age 32.88 years, range 14-58) agreed to a CL trial; 43 pre-presbyopes (17 sphere, 26 toric in at least one eye), 10 presbyopes. 26 (49%) went on to purchase [11 sphere (65%), 11 toric (42%), 4 multifocal (40%)], with 21 of these (84%) purchasing the same lens type as recommended by OptiExpert [9 sphere (82%), 8 toric (73%), 4 multifocal (100%)]. 18 of the 26 purchasers (72%) were prescribed the same final CL power as determined by OptiExpert and 21 (84%) were prescribed with lens BVP $\pm 0.25D$ or cylinder axis $\pm 10^\circ$ of pre-determined power.

Conclusions: This in-practice investigation highlights the benefits of an online fitting tool to aid the fitting process by providing an initial CL type and prescription to trial, which may help to reduce chair time, and enhance the overall fitting experience. In busy practices, support staff can help with this process by pre-selecting lenses using OptiExpert in advance of the eye examination.

Research funding received: N/A

Paper Number: 5

Presentation time: 10:10-10:20

Diurnal variation in ocular biomechanics in a group of young adults

Langis Michaud, Juliette Blanchard

Purpose: To determine the diurnal variation of the corneal biomechanics and to compare compensated IOP and Goldman tonometry during the day.

Method: Participants (32- 23 F/9M) were young Caucasians (21-28 years) and were seen at 3 different time during the day (baseline, +4h and +8h). Corneal biomechanics was assessed with a Scheimpflug Analyser (biOP- biomechanical corrected IOP; CBI- Corvis Biomechanical Index, TBI- Tomographic Biomechanical Index-Stiffness Parameters (SPA-1), Ambrosion Relative Thickness (Ar-Th), Deformation at the apex ration (DA-

ratio), Integrated radius (IR) and Goldman tonometry was measured at every session.

Results: CBI (normal <0.5) did not vary significantly (0.39/0.35/0.35); DA (ectasia suspected >5) did not vary as well (4.3/4.4/4.4); IR (soft cornea >10) was measured at 7.9/8.1/8.1. ArTh (normal 450-550) varied from 513 to 530 and 525 (not significant). SPA-1 (normal >90) was 98/96/95. Goldman tonometry showed 16.1/14.5/15.6 (significant difference for 2nd measure vs others) and bIOP 15.7/15.1/15.3 (no significant difference). Moderate inter-subject variations were observed.

Conclusions: Biomechanical indices do not vary significantly during the day while GAT showed lower IOP in early afternoon, as expected. IOP variation does not influence biomechanical parameters of the cornea.

Research funding received: None

Paper Number: 6

Presentation time: 10:20-10:30

Clinical performance of lehilcon A and comfilcon A SiHy contact lenses

Holly Lorentz, Ravaughn Williams, Gina Wesley, Katherine Bickle, Bradley Giedd, Bradley Hines, Christopher Pearson

Purpose: The purpose of this study was to assess the efficacy of lehilcon A, a new biomimetic water gradient monthly replacement SiHy contact lens, compared to comfilcon A lenses.

Method: This was a randomized, double-masked, multicenter, parallel group clinical study with bilateral lens wear for 3 months. Subjects were randomized in a 2:1 fashion and 77 subjects completed the study wearing lehilcon A and 38 subjects completed the study wearing comfilcon A. Lenses were worn in a daily wear modality with daily disinfection and monthly replacement. -1.00 D to -6.00 D in 0.25 D increments were available for both lens types. Distance Snellen VA, lens fit (movement and centration), and surface assessments (front surface wettability, front surface deposits, and back surface

deposits) were conducted.

Results: All eyes had a contact lens distance VA of 20/20 or better at the 3 month follow-up visit, except for one eye wearing lehilcon A, due to user error. At the 3 month follow up visit, 92.9% of lehilcon A lenses and 89.2% of comfilcon A lenses were graded to have optimal fit/movement. No unacceptably tight or loose fits were found. 98.7% of lehilcon A lenses and 94.6% comfilcon A lenses were graded to have optimal centration. In the grading of surface wettability and deposits, the large majority of scores for both materials were graded as 0 or 1, with minimal grades >1 (on a 0-4 scale, 0=none, 4=severe).

Conclusions: The results of this study showed that lehilcon A, a new biomimetic water gradient monthly replacement SiHy contact lens, provides excellent visual acuity, optimal lens fitting characteristics, and a clean/smooth surface after 3 months of daily lens wear.

Research funding received: This study was funded by Alcon. Holly Lorentz and Ravaughn Williams are employees of Alcon.

End of session