

NCC2016 Paper Abstracts
Free paper sessions
Monday, March 14, 2016 14:15 – 15:15
Netherlands, Veldhoven, de Koningshof,
Baroniezaal

Organization Section: NCC/ BCLA
Moderator: Carolina Kunnen

Paper Number: 12

Presentation time: 14:15-14:30

Tear Exchange Beneath a Vaulted Hybrid Contact Lens

Peg Achenbach, Jan Bergmanson, William Miller, Maria Walker, Daniel Powell, Roxana Hemmati, Kelsea Skidmore

Purpose: Little is known regarding the tear hydrodynamics under different contact lens modalities. Even less is known regarding vaulted lenses. This study was an effort to assess if the tear ventilation in a hybrid modality provided sufficient tear exchange with respect to soft, GP and scleral designs. This new knowledge will provide a baseline for future study and hybrid lens design.

Methods: Seventeen existing contact lens wearers diagnosed with keratoconus were fitted with SynergEyes UltraHealth vaulted lenses. Patients were fitted in both the lower, fixed lift vault, and the upper, variable lift vault, depending on their requirements. Their lens-corneal tear reservoir was determined by the Visante OCT and the tear exchange was assessed with the Fluorotron Master FS2 fluorophotometer. After baseline measurements were taken, the lenses were re-applied with high molecular weight NaFl (FITC Dextran) in a Unisol solution, and baseline fluorophotometry measurements were taken. Approximately five minutes after, a second fluorophotometry reading was performed to establish post-lens tear flow. Measurements were continued every five minutes until the fluorescein concentration returned to baseline. Post-lens tear thickness was determined with the Visante OCT while the subjects were wearing the lenses.

Results: Only the data exhibiting a decay curve correlation coefficient over 0.40 was considered and analyzed which included 28 eyes indicating a strong positive correlation in the curve fitted data. The data analysis showed a median slow decay rate of 2.03%/min with a standard deviation of 2.66%/min. The tear exchange range was measured between 0.021 and 10.95%/min.

Conclusions: This study demonstrates a tear exchange rate for hybrid contact lenses

that is two times greater than measured with scleral lenses. This is a notable physiological advantage of the hybrid contact lens over the scleral contact lens. Further research is desirable to establish tear exchange rates in other contact lens modalities.

Research funding received: SynergEyes provided a grant for this research.

Paper Number: 13

Presentation time: 14:30-14:45

Peripheral tear mixing under scleral lenses fitted with various clearances.

Langis Michaud, Tiffany L. Yuen, Bo Tan, Allison Moy, Andrew D. Graham, Meng C. Lin

Purpose: To evaluate the post-lens tear film (PoLTF) exchange at the periphery of scleral lenses fitted with various clearances.

Methodes: This was a prospective, randomized, bilateral, crossover study. Six neophytes to contact lens wear were fitted with mini-scleral lenses with three different central clearance, varying from 100 to 400 um, worn in randomized order. Tear exchange was evaluated by placing 5 uL of 2% FITC-Dextran onto the superior bulbar conjunctiva and by evaluating the out-in-time (OIT) to see the first sign of fluorescein in the PoLTF through a slit lamp.

Results: The mean OIT recorded were 34 + 26 sec (median= 23) for the optimal clearance (244 + 29 um), 177 + 118 sec (median= 205) for the shallow fit (125 + 17 um) and 143 + 123 sec (median 109) for the excessive one (411 + 69 um). These differences were statistically significant for shallow vs optimal (p=0.0238), excessive vs optimal (0.0481) but not for excessive vs shallow (p=0.7993)

Conclusion: Overall, results suggest that OIT is shorter when the scleral lens is fitted with optimal clearance compared to shallower or excessive one. OIT can become a convenient method and a good indicator of the quality of the scleral lens fit.

Research funding received: Essilor USA provided contact lenses and research fund for this work

Paper Number: 14

Presentation time: 14:45-15:00

Non Invasive Assessment of In Vivo PLTF Stability of Toric/Multifocal DD CL Compared With Spherical DD CL in an Objective and Subjective Way

Sebastian Marx, Cecile Maissa, Julia Wittekind, Wolfgang Sickenberger

Purpose: Evaluation of the tear film characteristics of different nelfilcon A contact lens designs using placido ring projection.

Method: A prospective, randomized, bilateral, cross-over study design was conducted. 48 adapted soft contact lens wearers were enrolled, including Presbyopes and Astigmats with good tear film stability. Presbyopes were assigned to nelfilcon A multifocal lenses (MF) and Astigmats to nelfilcon A toric (T) lenses followed by nelfilcon A sphere (Sph) lenses, or vice versa, for both groups. Tear film videos were recorded after 5 minutes, 8 hours, and 12 hours of lens wear. A semi-objective analysis of the videos was conducted to evaluate the maximum % distortion and % distortion at 5 seconds (~ normal blink interval) and 10 seconds (~ blink interval during computer use) post-blink.

Results: In both groups, the mean percentage of distortion at 5 seconds post-blink was lowest without lenses (Astigmats $\leq 0.2\%$; Presbyopes $\leq 0.4\%$). During lens wear, the average percentage of distortion at 5 seconds post-blink was never worse than 2.9% and 1.6% respectively for Presbyopes (MF=2.9%; Sph=1.7%) and Astigmats respectively (T=1.5%; Sph=1.6%). The mean percentage of distortion observed 10 sec post-blink was higher; ranging from $\leq 2.2\%$ and $\leq 1.9\%$ without lenses to 13.4% and 10.3% respectively in the Presbyope and Astigmat groups during the 12 hours of wear the nelfilcon A designs. In Presbyopes the mean maximum % distortion increased from 11%-15% pre contact lens wear to 35%-36% on average during wear and in Astigmats from 11% pre-contact lens wear to 26%-28% during wear.

Conclusion: The semi-automated measures of the tear film were increased during wear but remained good after 12 hours of wear of nelfilcon A. These results are consistent with subjective break-up times recorded in this study and previously reported high inter-subject variability of tear film measures.

Research funding received: The research was funded by Alcon Vision Care in Forth Worth.

Paper Number: 16

Presentation time: 15:00-15:15

Eye symptoms and visual functioning in a modern office; Subjective and clinical signs at an "in office" eye examination

M.M.A van Tilborg, P.J Murphy, K.S.E. Evans

Purpose: One of the problems that occur with symptoms of ocular discomfort is the variety of subjective complaints. The indoor environment and reading tasks or computer work during the day is known to exacerbate symptoms. By examining the eyes "in-office", environmental conditions can be considered as a constant in all participants, leaving only subjective ocular symptoms and clinical signs for investigation.

Method: Employees at a modern office building in the Netherlands were invited to participate by internal mail. Exclusion criteria were; pregnancy or breast-feeding, refractive surgery within 6 months, Sjogren's disease or employed less than four months. The "in-office" examination consisted of stray light measurement and assessment of visual acuity with habitual correction. A follow-up appointment included general and ocular history, details of the last eye examination, subjective eye-related symptoms including the OSDI and anterior eye examination. Referrals or recommendations were made as appropriate.

Results: Of the 81 participants 68 completed the full examination; 23 male (mean 48 years \pm 2.07) and 45 female (mean 47 years \pm sd 1.38). The last eye examination was performed by (refracting) optician (54.0%), contact lens specialist (11.1%), optometrist (1.6%) and ophthalmologist (20.6%). 12.7% had not had an eye examination previously. Mean rank of symptoms experienced at the examination was tired eyes (3.96), burning eyes (4.49) and dry eye symptoms (4.96) (Friedman test; $p=0.00$). Females had a significantly higher OSDI score than males (Pearson Chi square; $p=0.000$). Outcome of referrals; MGD \geq grade 2 (45.6%), required refraction (29.4%), allergy related findings (20.0%), blepharitis (19.1%), glaucoma suspect (18.0%), contact lens related (11.0%).

Conclusion: The impact of dry eye symptoms on daily activities at work should not be underestimated by the employer. Symptoms can be exacerbated by underlying factors such as an incorrect prescription, MGD, blepharitis or allergy. Facilitating screening of eye related symptoms in an office environment could be beneficial to help promote ocular comfort.