

NCC 'FUTURE GENERATION 2024' POSTER Abstracts
SCIENTIFIC SESSION IN COOPERATION WITH THE BCLA

NCC 'Future generation 2024'

Organization Section: NCC/ BCLA

POSTER Abstracts

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Impact of scleral lens anterior and posterior asphericity on high order aberrations

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Purpose: To evaluate the influence of anterior lens asphericity (ASA) on the visual performance of SL wearers in two distinct groups (keratoconus and non-keratoconus).

Method: Participants were assigned to group 1 (G1: KC) or 2 (G2: non-KC). Each participant worn a set of 4 scleral lenses (SL) with various ASA randomly assigned. SL of 15.6 mm diam were fitted with minimal central vault (200 to 300 um) and toric peripheral curves to keep them centered. Clinical assessment consists of distance high-contrast visual acuity (HCVA), low-contrast visual acuity (LCVA) and high order aberrations (HOAs) measured at 3 to 6 mm of pupil diameter.

Results: 12 participants were assigned to G1 and 9 to G2. Both groups are found statistically similar except for the average age (G1 being older [$p = 0,017$]). G1 participants are showing higher overall HOAs ($P=0.01$) than G2, if fitted with conventional SL, and present lower HCVA [$p = 0,0003$] and LCVA [$p= 0,0003$], regardless of the lenses worn. [$p = 0,4312$]

Increasing ASA reduces the level of overall HOAs for G1, especially for spherical aberrations and coma ($p<0.001$). These results are also influenced by pupil diameter. This is also true for G2, but at a lesser extent. Coma and Overall HOAs are reduced ($p< 0.001$) when ASA increases,

with no impact on other specific aberrations. In both groups there is a huge inter-subject variability.

Conclusions: These results indicate that manipulating SL anterior asphericity can reduce HOAs, especially for KC patients, while it has limited impact on non KC ones. This modification does not translate in a better VA however. It is not then possible to determine an optimal ASA for everybody. It has to be customized to the patient.

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