

NCC 'FUTURE GENERATION 2024' PAPER Abstracts
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PAPER Abstracts

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Short-term optical and visual performance of soft contact lenses for myopia management

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Purpose: The aim was to evaluate the effects of soft lenses for myopia control on ocular high order aberrations (HOAs), light disturbance (LD), and high (HC) and low (LC) contrast visual acuity (VA).

Method: Sixteen myopic volunteers (19.5±2.7yrs) participated. Best-corrected HCVA and LCVA, LD, HOAs and Strehl Ratio (SR) were obtained from REs without a CL. All subjects were fitted with multiconcentric (MySight, CooperVision, type 1), CD multifocal (Biofinity multifocal CD, CooperVision, type 2), catenary optics (NaturalVue multifocal, Visioneering Technologies, type 3) and non-monotonic & aperiodic optic (Mylo, Mark'ennovy, type 4) CLs. All measurements were repeated with every lens after 30min from application.

Results: There were no statistically significant differences in best-corrected HCVA between baseline and with lens wear but LCVA was lower for all the lenses tested ($p < 0.05$), with higher values for type 1 and 2 designs (resp. $0.31 \pm 19 \log \text{MAR}$ and $0.23 \pm 12 \log \text{MAR}$) and lower values for type 4 and type 3 ($0.18 \pm 0.20 \log \text{MAR}$ and $0.16 \pm 16 \log \text{MAR}$). Compared with baseline, type 1, 2 and 3 all induced a significant increase in HOAs (from $0,125 \pm 0.088 \mu\text{m}$ to resp. $0,445 \pm 0.124 \mu\text{m}$, $0,290 \pm 0.132 \mu\text{m}$, and $0,355 \pm 0.096 \mu\text{m}$). Spherical aberration showed a significant positive shift with type 1, 2 and 3 (from $0,042 \pm 0.045 \mu\text{m}$, to

resp. $0,152 \pm 0,074 \mu\text{m}$, $0,075 \pm 0.112 \mu\text{m}$, and $0,165 \pm 0.126 \mu\text{m}$) but a negative shift with type 4 ($-0,056 \pm 0.063 \mu\text{m}$). Horizontal coma increased in positive direction for all lens designs (from $0,066 \pm 0.034 \mu\text{m}$, to resp. $0,295 \pm 0,106 \mu\text{m}$, $0,262 \pm 0.124 \mu\text{m}$, and $0,246 \pm 0.098 \mu\text{m}$) except for type 4 ($-0,095 \pm 0.137 \mu\text{m}$). All lens induced a significant reduction of SR from baseline and an increase LD, with higher effects in type 1 and lower effects with type 4.

Conclusions: All lens tested provide satisfactory distance HCVA, but a reduction in LCVA. HOAs values were increased in all lens types, but with a different amount, with the lower increase in type 4. Our results seem to indicate that 4 and 3 type lenses cause a better visual performance.

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