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POSTER Abstracts
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Improvement of RGPCL Surface Properties by MPDS Containing a Novel Hyaluronic Acid Derivative

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Purpose: To evaluate the hydrophilicity of GPCLs with and without Hydra-PEG (HP) coating using a GPCL multi-purpose disinfecting solution (MPDS) containing a low molecular weight hyaluronic acid derivative (HAD) with hydrophobic groups.

Method: a) HP-coated Acuity 200 lenses were repeatedly immersed in ISO-PBS, MPDS A with fluorescent labeled hyaluronic acid and MPDS A with fluorescent labeled HAD for 8 hours, followed by 16 hours in ISO-PBS. HAD adsorption was confirmed by measuring fluorescence intensity with fluorescence microscopy. b) Non-coated Acuity 200 lenses were immersed in artificial tear solution (ATS) with proteins, lipids and inorganic salts for 16 hours, and then repeatedly immersed in MPDS A with or without HAD for 8 hours. Contact angle was measured over time using sessile drop method. c) HP-coated Acuity200 lenses were immersed in ATS for 16 hours and then repeatedly immersed in MPDS A with HAD or conventional commercial MPDS B for 8 hours, and the contact angle was measured.

Results: a) After 13 cycles, HAD significantly adsorbed on the surface of the test lenses compared to conventional HA and plateaued ($p<0.05$). b) The contact angle of lenses treated with MPDS A / HAD decreased over time and became equivalent to HP-coated lenses (43°) after 30 cycles. No change was observed for contact angle of lenses treated with MPDS A without HAD. c) From 21 cycles in MPDS B, contact angle deteriorated significantly ($p<0.05$) and was not significantly different from initial non-coated lenses (62°) at 90 cycles. The contact angle of lenses treated with MPDS A / HAD was significantly lower ($p<0.05$, 37° at 120 cycles).

Conclusions: HAD binds to GPCL surfaces with each use and continues to provide the same level of hydrophilicity as HP-coated lenses despite deposition of tear fluid-derived components, and improves the hydrophilicity of HP-coated lenses.

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