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Title

Influence of contact lens care solutions on the water content of hydrogel and silicone-hydrogel contact lenses

Purpose

The aim of this work was to study variations in water content (WC) of hydrogel and silicone-hydrogel contact lenses (CL) when preserved in different lens care systems.

Material and Method

Four silicone-hydrogel CL (Senofilcon A, Balafilcon A, Comfilcon A, Lotrafilcon B) and one conventional CL (Etafilcon A) and commercially available lens care solutions (Renu Multiplus™ and Biotrue (Bausch & Lomb), Optifree Puremoist and Aosept® Plus (CIBA Vision) were used.

Lenses were immersed in each lens care system during 12 hours and then RI was determined with the digital automated refractometer (CLR 12-70, Index Instruments, 174 Cambridge, UK). Water content was directly obtained with this instrument using RI values and the equation given in BSO ISO 10339:1997.

Measurements were performed before and after the lenses have been immersed in each care solution. Two CL of each combination (CL + solution) were tested, and five measurements per lens were obtained.

Results

The mean values of WC (in %) obtained for each lens material when CL were removed from their blisters (baseline value) was for: Etafilcon A (55.75 ± 0.52); Comfilcon A (45.84 ± 0.28); Senofilcon A (37.01 ± 0.98), Lotrafilcon B (25.53 ± 0.42) and Balafilcon A (34.61 ± 1.03).

Substantial changes and statistically significant were observed on these parameters when exposed to lens care systems depending on the CL material and the solution. Senofilcon A decreased the WC with all the solutions contrary

of lotrafilcon B where it was observed an increase in WC with all the solutions. Comfilcon A remained approximately with the same values of WC. Balafilcon A and Etafilcon A showed an irregular behavior increasing or decreasing depending on the solution.

Conclusions

The present study reveals that solutions induce changes in the CL properties studied showing the existence of interactions between CL material and lens care solution. These interactions can be essential when eye care practitioners choose the most appropriate lens care product for CL, especially when the patient present symptoms of discomfort or dryness.