Effect of In-eye Cleaning Drops in the Reduction of Deposits on Silicone Hydrogel Contact Lenses

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Introduction:

Minutes after insertion of contact lenses, debris starts depositing on the surface of the lens. Deposits on the lens surface might compromise wearing comfort and induce immunological and inflammatory responses like papillary conjunctivitis.[1] Although silicone hydrogel contact lenses accumulate much less protein than conventional hydrogel lens materials and offer very good clinical performance, they attract more lipid deposits.[2] We still encounter some wearers complaining of discomfort at the end of the day and throughout the life cycle of the contact lens. Many times this discomfort is due to deposits that build up more rapidly in certain contact lens wearers. We conducted a multicenter study to evaluate the cleaning performance of Blink'n'Clean (Abbott Medical Optics Inc., Santa Ana California) eye drops in silicone hydrogel contact lenses in situ.

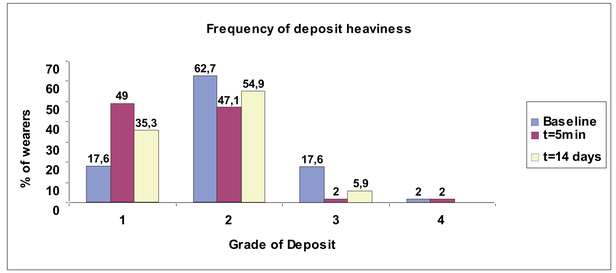
Methods:

Fifty-one contact lens wearers (mean 37.16 ±13.92 years, range 15-78), who were prone to deposits on silicone hydrogel lenses were instructed to use 2 drops of Blink'n'Clean in each eye, twice daily, over a period of 2 weeks. We used the modified Rudko validated scale for assessment of deposits (heaviness and extension) on contact lenses. Corneal staining, with fluorescein, and hyperemia were assessed with the help of the CCLRU scale. Non-invasive break-up time (NIBUT) and lid-parallel conjunctival folds (LIPCOF) were also measured. NIBUT was evaluated without application of fluorescein with different kinds of mires, such as placido disc of the videokeratograph or mires of the keratometer. In addition, a subjective questionnaire was given to wearers. Evaluations were done before the first instillation and 5 minutes after the first eye drop instillation, and after 14 days of daily use.

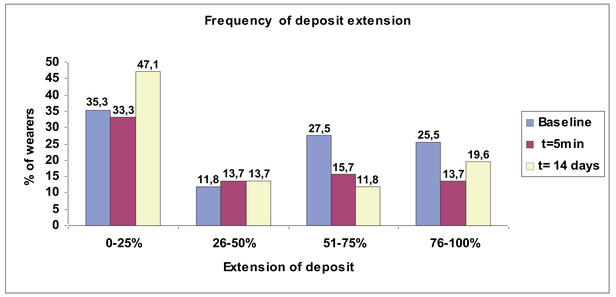
Results:

Deposits:

Gradation using the Rudko scale show significant differences in deposit heaviness between the change from basal values and both the values obtained 5 minutes after the first instillation, as well as those obtained after 14 days of daily instillation ($p<0.001$ in both cases).



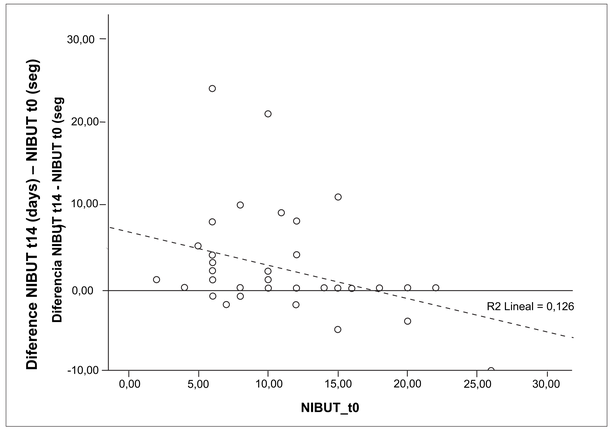
Deposit extension values decreased after the initial five minutes compared to baseline ($p=0.06$). These values remain low, with no significant difference between the values after 14 days of eye drop use and those obtained 5 minutes following the first instillation ($p=0.134$).



Hyperemia, LIPCOF, Corneal Staining There is no statistically significant difference after 14 days of eye drop use in the measurement of hyperemia ($p=0.157$), LIPCOF ($p=0.102$) or corneal staining ($p=0.637$).

NIBUT:

Results of the mean change from baseline NIBUT show statistically significantly higher NIBUT values after 14 days of regular use of Blink'n'Clean eye drops ($p=0.019$), with an average of 2.5 more seconds. NIBUT values 5 minutes after instillation were not statistically significantly different from baseline ($p=0.179$).



Subjective questionnaire:

Statistically significant differences appear with regards to the frequency of dirty lens sensation ($p=0.012$), and wearing comfort after using Blink'n'Clean ($p=0.033$) for 2 weeks, with improvement in both cases after eye drop use.

Conclusion:

Blink'n'Clean drops produced a statistically significant reduction of deposits in terms of heaviness and extension right after instillation, and this difference was maintained after two weeks of use. The reduction of deposits and the stabilization of the tear film translated into a more comfortable wearing experience. The combination of an appropriate MPS with in-eye cleaning drops will reduce deposits on the lens surface and increase tear film break-up time, thus improving the contact lens wearing experience without causing negative impact, such as corneal staining, hyperemia and LIPCOF.

1. Zhao et al, Contact Lens Deposits, Adverse Responses, and Ocular Parameters. Optom Vis Sci 2010;87:669–674
2. Zhao et al. Silicone Hydrogel Contact Lens Deposition. Optom Vis Sci 2009;86:251–259

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