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A comparison of weekly cleaners on hydrophilic contact lenses

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A comparison of weekly cleaners on hydrophilic contact lenses

Abstract
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A Comparison of Weekly Cleaners on Hydrophilic Contact Lenses

By

Jep Lund
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John Lawson
ABSTRACT

This study examined the effects of three weekly soft lens cleaners on deposits found on hydrophilic lenses. Lenses cleaned by Allergan Soflens Enzymatic(AE), Alcon Optizyme(AO) and Barnes Hind(BH) weekly cleaner were submitted to Allergan Pharmaceuticals for soft lens deposit identification. Results indicated a reduction of deposits on 30.8% of the lenses cleaned with AO, 41.0% of those cleaned with AE and 43.6% of those cleaned with BH.

INTRODUCTION

A common problem requiring the replacement of hydrophilic contact lenses is the development of deposits on the lenses.\textsuperscript{1} Deposits on soft contact lens surfaces are potentially one of the most serious complications of soft lens wear, as shown by recent morphological and biochemical publications.\textsuperscript{2} Soft contact lens deposits vary from minor discolorations to thick opaque deposits. These deposits often can lead to patient dissatisfaction with soft lens wear, frequent lens replacements and discontinuation of their use.\textsuperscript{3} Removal of these deposits can be the difference between a successful contact lens patient and a contact lens failure. Weekly cleaners are used to help prevent these deposits from forming. The purpose of our research was to compare the effectiveness of different weekly cleaners available.
METHODS AND MATERIALS

This study used 54 soft contact lenses collected from several contact lens practitioners in the Portland, Oregon area. All the contact lenses used in the study had been deemed unwearable for the patient due to staining and/or deposit problems. Nothing was known as to the history of each lens or patient.

All the lenses were initially cleaned in Barnes Hind daily cleaner with their hands off spinner(Hydromat). After being cleaned with the daily cleaner the lenses were cut into quarters with iris scissors.

One quarter of each lens was used as the control on which no weekly cleaner was used. Another quarter was cleaned in Barnes Hind(BH) weekly cleaner as per manufacturers instructions for two hours. One quarter was placed in Allergans Soflens Enzymatic cleaner(AE) as per manufacturers instructions for two hours. The final quarter was placed in Alcons Optizyme(AO) as per manufacturers instructions for two hours. Each lens section was then rinsed thoroughly with normal saline and sealed in a sterile vial containing normal saline.

The lens sections were then packaged and sent to Allergan laboratories in Irvine, California. The lenses were analyzed by the soft lens Deposit Identification Program and a report on each lens quarter was obtained. Lens evaluation was done as follows: 1) Viewing the lenses under normal room lighting without the use of a magnifying device or an intense light source. If deposits are visible under these conditions it is classified as a type IV deposit. 2) If no deposits are found, a 7x magnifier is utilized along with a powerful beam of light and a dark background.
Deposits found under this condition are classified as type II. 3) A type I deposit is one that is found only by using 100x magnification. 4) The lens is then classified as clean if no deposits are found.

RESULTS

Thirteen of the original fifty four lenses were identified as being clean, having no deposits. The remaining forty one lenses were described as having deposits. Two of the forty one lenses were submitted in quarters but not treated with any weekly cleaners to determine technician deposit analysis grading error (no error was found). The deposits found were divided into six groups: Pigment granules (PG), Protein film (PF), Mercurial deposits (M), Microorganisms (MO), Lens calculi (LC) and Unknown (U).

FIGURE 1
The distribution of deposits on the thirty nine control lens sections were as follows; Pigment granules were isolated on two lenses, microorganisms were found on one lens, four lenses contained lens calculi, two exhibited mercurial deposits, and twenty test lenses had protein film. The remaining ten lenses had deposits classified as unknown.

By using a matched comparison of the lens quarters it was found that none of the cleaners had any effect on removing mercurial deposits. Both AO and BH weekly cleaner improved one of the two lenses found to have pigment granules, while AE was judged to have no effect on the pigment granules. All three cleaners were found to improve the one lens with microorganisms. Of the four lenses found to have lens calculi BH and AE improved two, while AO improved one. The deposits classified as Unknown were reduced on five of ten lenses cleaned with AE, while BH reduced the deposits on four of the lenses and AO improved three of the ten lenses. Of the twenty lenses judged to have proteins nine were improved by BH, eight were improved by AE and six were improved by AO. See figure 1.

DISCUSSION

From the results it can be seen that no weekly cleaner was superior in removing all of the various forms of deposits that are normally found on soft contact lenses. Since the information regarding the specifics of the patient care regime, the lens material and lens age were unavailable, only general statements can be inferred. However, because lens deposits occur in an estimated 50-70% of all hydrophilic lenses, the elimination or reduction of the deposit formation may be best achieved by matching the weekly cleaner to the specific deposit type.
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REFERENCES