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The Effect of Conventional and Silicone Hydrogel Contact Lenses Wear on the Tear Film

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Abstract

Purpose: The aim of this study was to evaluate the effect of one conventional hydrogel and four silicone hydrogel daily wear contact lenses on the volume and stability of the tear film. The tests were performed with a group of patients with no previous contact lens experience before and after 6 months of contact lenses wear.

Methods: Tear film stability and volume were monitored on 49 eyes before and after contact lenses wear. The contact lenses tested were: 10 Galyfilcon A, 7 Balafilcon A, 10 Lotrafilcon A, 7 Lotrafilcon B and 15 Etalfilcon A.

Each silicone hydrogel lens was used for 1 month and the conventional hydrogel for 15 days.

Tests to assess the tear film stability:

Break-up-time (BUT):

– Time of lachrymal rupture: since the last blink until the appearance of the first dark zone;

Non Invasive Break Up Time (NiBUT):

– In a biomicroscope at 16x magnification, the Keeler Tearscope Plus, with the help of a grid insert, was used to observe the regularity of the image of the grid.

Tests to assess the tear volume:

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Total Tear Meniscus Height:

– Observed in a slit lamp with a milimetric eyepiece:

Phenol Red Test:

– It was measured the length of the thread which colour was modified from yellow to red because of the effect of the tear pH.

Results:

USAN	BUT (a)	BUT (b)	NiBUT (a)	NiBUT (b)	Red Phenol (a)	Red Phenol (b)	Meniscus (a)	Meniscus (b)
Etafilcon A	6.78	6.07	17.07	10.56	26.13	27.40	0.52	0.56
Galyfilcon A	6.67	6.20	17.61	10.41	26.40	29.30	0.50	0.59
Balafilcon A	4.83	5.97	12.60	8.03	25.86	26.14	0.54	0.64
Lotrafilcon A	5.61	7.73	20.77	16.25	26.80	28.90	0.50	0.60
Lotrafilcon B	8.44	6.37	25.26	15.14	22.43	24.33	0.57	0.56

USAN: United States Adopted Name

BUT (a): medium values for BUT in the first day, in secs

BUT (b): medium values for BUT after 6 months, in secs

NiBUT (a): medium values for NiBUT in the first day, in secs

NiBUT (b): medium values for NiBUT after 6 months, in secs

Red Phenol (a): value in the first day, in mm

Red Phenol (b): value after 6 months, in mm

Meniscus (a): value in the first day, in mm

Meniscus (b): value after 6 months, in mm

Conclusions: – Apparently the tear film stability reduces whereas tear film quantity increases after contact lenses wear of all types . However on account of the limited number of patients involved in the study the difference are not statistically different.

Key Words: contact lens • cornea: tears/tear film/dry eye • clinical research methodology



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