Lid Wiper Epitheliopathy (LWE) is a clinical sign of ocular irritation that is believed to be caused by increased friction and shear forces between the palpebral lid margin region and the ocular surface. It may result from decreased lubrication caused by alterations in the tear film and its mucous component and the apposing bulbar conjunctiva and cornea and/or contact lens surface in lens wearers and may be detected by vital staining of the upper (UL) and lower (LL) lid margin surfaces.

Lid wiper epitheliopathy is considered an early sign of dry eye disease and has been observed with a greater prevalence in symptomatic dry eye patients who exhibit tear film deficiencies. Such deficiencies may alter the tear film and ocular surface especially under adverse environmental conditions including temperature, airflow and low relative humidity (RH).

In daily disposable lens wearers the causation of LWE due to the effect of wind and humidity over a period of time and its recovery with pharmacological intervention have not been investigated.

Purpose

To measure the clinical grades of LWE in contact lens (CL) wearers before and after exposure to a low humidity environmental exposure chamber (LH-EEC) with controlled conditions of temperature and air flow velocity.

Materials and Methods

This was a double-masked feasibility study consisting of two visits:

- Visit 1 (Screening Visit): Subjects wore habitual CLs for at least four hours prior to this initial visit. To be included in the study, subjects with healthy eyes had to demonstrate an OSDI score >15 and a LWE grade ≥2.
- Subjects were asked to discontinue CL wear and instill Refresh Tears® (ATs) for 48 hrs. in both eyes prior to Visit 2.

Methods (continued)

Screening (Visit 1)

10 Symptomatic subjects (OSDI score > 15) wore habitual CLs for 4 hrs.

Methods (continued)

LWE evaluation

- LWE assessment: (0-3 scale).

Baseline

- Baseline LWE grades increased significantly with CL wear in both the UL and LL after 180 mins.

CL wear was discontinued and Refresh Tears® instilled t.i.d. for 48 hrs. OU.

Results (examples of UL and LL staining)

- LWE grades increased significantly with CL wear in both the UL and LL after 180 mins. of exposure to environmental conditions with low humidity and moderate airflow velocity.

- The use of ATs had no effect in LWE reduction during the 180 mins.

- The mean UL LWE grades increased from Baseline to PC: 1.25 to 2.23 for nonafilcon A, and 1.18 to 1.93 for etafilcon A (all p<0.05), Figure 4.

- The mean UL LWE grades at PC=120 were 2.47 and 2.42 for nonafilcon A and etafilcon A, respectively (all p<0.05), Figure 4.

- After 180 mins, in the LH-EEC, mean LWE grades changed from Baseline to PC: 1.00 to 2.48 for nonafilcon A and 0.90 to 2.03 for etafilcon A (all p<0.05), Figure 5.

- The mean LWE grades at PC=120 were 2.11 and 1.89 for nonafilcon A and etafilcon A, respectively (all p<0.05), Figure 5.

Conclusion

- LWE grades increased significantly with CL wear in both the UL and LL after 180 mins.

- The use of ATs had no effect in LWE reduction during the 120 mins.

- The LH-EEC model may prove a valuable tool to study conditions that result in alterations in Lid Wiper Epitheliopathy.

References


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