Effects of alkali burn of the ocular surface on meibomian gland structure in mice

Shin Mizoguchi1, Yuka Okada1, Reiko Arita2, Geraint J Parfitt3, Yilu Xie3, James V Jester3, Shizuya Saika1

1Ophthalmology, Wakayama Medical University
2Itoh Clinic
3University of California, Irvine

Purpose: To examine the effects of total ocular surface alkali burn on meibomian gland structure in mice.

Methods: Three μL of 1 N NaOH were applied under general anesthesia to the right eye of 10 week old C57BL/6 (n = 10) or BALB/c (n = 10) mice to produce a total ocular surface alkali burn. Following healing intervals of 5, 10 and 20 days, the animals were killed and both upper and lower eyelids were excised. Meibomian glands were observed in both upper and lower eyelids under binocular microscope. Hematoxilin-Eosin, oil red O stain and immunohistochemistry for PPARγ were employed.

Results: As early as day 5 post-alkali burn deletion or marked dilation of meibomian gland duct was well observed. Oil red O stain showed the substance in the dilated duct was Meibum. PPARγ staining was markedly reduced in alkali-burned tissue as compared with an uninjured meibomian glands.

Conclusions: Deletion or dilation of meibomian gland duct was caused by ocular surface alkali burn.

Key words: meibomian gland, alkali burn