

TITLE: Necessity of the evaluation of both upper and lower eyelids in patients with meibomian gland dysfunction -A Multicenter Study-

ABSTRACT BODY:

Purpose: Meibomian gland dysfunction (MGD) is a major cause of the dry eye disease.

Meibomian glands are located in both upper and lower eyelids, however, different changes of the meibomian glands in both eyelids have not been identified. We investigated morphology of the meibomian glands by non-invasive meibography, and compared the tear film parameters in MGD patients and healthy adults to determine correlation between the difference in upper and lower eyelids.

Methods: MGD patients (54 eyes, male 14, female 40, average age 63.8 ± 14.1) were diagnosed on the basis of criteria by Japan meibomian gland working group. Age and gender-matched healthy volunteers (119 eyes, male 46, female 73, average age 62.6 ± 16.2) were enrolled as control subjects. One eye in each subjects was analyzed. Dry eye symptoms (14 subjective symptoms), lid margin findings (0-4), corneal staining (0 to 3), the fluorescein tear film breakup time (BUT) were evaluated. Tear fluid production was measured by Schirmer's test without anesthesia. The morphology of meibomian glands in both upper and lower eyelids was evaluated by non-invasive meibography. Partial or complete loss of meibomian glands was scored (meiboscore, MS, 0 to 3).

Results: MS in the Upper/ lower eyelids of MGD and control group were $1.7 \pm 1.0 / 2.1 \pm 1.0$ and $0.7 \pm 0.8 / 0.9 \pm 1.0$, respectively ($p < 0.0001$). Numbers of symptoms, lid margin findings, corneal staining, BUT and Schirmer's test in the MGD/ control group were $6.2 \pm 2.5 / 3.5 \pm 2.3$ ($p < 0.0001$), $2.5 \pm 1.0 / 0.7 \pm 0.9$ ($p < 0.0001$), $0.6 \pm 0.7 / 0.1 \pm 0.2$ ($p < 0.0001$), $3.2 \pm 2.0 / 6.2 \pm 2.6$ ($p < 0.0001$) and $11.6 \pm 7.7 / 15.3 \pm 9.9$ ($p = 0.003$), respectively. In MGD group, MS in upper eyelids were different from that in lower eyelids ($p = \text{xxxx}$). Two or more lines difference in MS was observed in 31.5% of the MGD group and in 10.9% of the control group.

Conclusions: MS in upper eyelids was significantly different from that in lower eyelids in MGD group. Furthermore, the difference of two lines was observed in more than 30% MGD patients. Our investigation indicated that observation of both eyelids is essential for the adequate evaluation of the morphology of meibomian gland.

(No Image Selected)