

Meibomian Gland Dysfunction in Patients with Sjögren Syndrome

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Objective: Changes in the ocular surface of patients with Sjögren syndrome (SS) often are more severe than those in patients with dry eye without SS. This study was conducted to investigate the possible involvement of meibomian gland dysfunction in SS-related ocular surface abnormalities.

Design: A nonrandomized, prospective, clinical study.

Participants: Twenty-seven eyes of 27 consecutive patients with SS (SS group) were studied. Twenty-nine eyes of age- and gender-matched non-SS patients with aqueous tear deficiency (non-SS group) were examined as control subjects.

Intervention: Changes in the ocular surface, tear function, and meibomian gland were examined.

Main Outcome Measures: Tear evaporation rate, meibomian gland expression, and meibography were measured.

Results: Fluorescein and rose bengal staining scores were significantly higher in the SS group than in the non-SS group ($P = 0.0001$). Evaporation of tears was increased significantly in the SS group compared with the non-SS group. There were no significant differences in the rate of tear production between the SS and non-SS groups. Meibography showed that 11 (57.9%) of 19 eyes in the SS group had gland dropout (i.e., histologic destruction of meibomian glands) in more than half of the tarsus. The incidence was significantly higher than that in the non-SS group (5 [18.5%] of 27 eyes; $P = 0.005$).

Conclusions: The results of this study indicate that destruction of meibomian glands and an increase in tear evaporation often are associated with changes in the ocular surface in patients with SS. Severe ocular surface changes in patients with SS may be attributed, in part, to the meibomian gland dysfunction.

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Meibomian glands secrete lipids into tears, and the lipids form an oily layer of precorneal tear film that is responsible for preventing excessive evaporation of tears.¹ Obstruction of meibomian gland orifices causes obstructive meibomian gland dysfunction (MGD). The disorder results in a decrease of lipid supply, which subsequently causes an increase in tear evaporation.^{2,3} We have reported that patients with MGD showed ocular surface abnormalities and experienced ocular discomfort despite having normal tear flow rates.³ We also showed that the incidence of MGD not associated with Sjögren syndrome (SS) was not different between normal subjects and patients with decreased tear production.³

In evaluating changes in the meibomian glands of patients with dry eye, we noticed that the glands often were severely impaired in those with SS. Although desiccation is known to be a major component of SS-related ocular sur-

face abnormalities, patients with SS often exhibit more severe changes in the ocular surface than do patients with dry eye without SS.⁴ We hypothesized, therefore, that MGD may contribute to ocular surface changes in patients with SS. To test this hypothesis, we conducted a prospective, clinical study in patients with SS and in age- and gender-matched non-SS dry eye patients. Tear function tests, including a tear evaporation test, as well as a complete evaluation of the ocular surface and examination of the meibomian glands were performed.

Patients and Methods

We examined a consecutive series of 27 patients with SS (SS group) in a prospective fashion. For the diagnosis of SS, the following four criteria as proposed by Fox et al⁵ were used: (1) objective evidence of keratoconjunctivitis sicca by fluorescein and rose bengal staining; (2) objective evidence of diminished salivary gland flow; (3) presence of lymphocyte foci in minor salivary gland biopsy; and (4) evidence of systemic autoimmune process. Patients were all women who were 52.4 ± 9.2 years of age (mean \pm standard deviation). Twenty-nine patients without evidence of SS and who had both a decrease in tear production (≤ 5 mm in Schirmer's test) and positive vital stainings (fluorescein ≥ 1 or rose bengal ≥ 3) also were examined (non-SS group). Subjects in the non-SS group also were women and were matched in age with those in the SS group (mean age, 54.1 ± 15.6 years). Only the right eye of SS and non-SS subjects was used for analysis. Eyes

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