Saudi Journal of Ophthalmology (2017) xxx, xxx–xxx

Original article

Meibography for eyes with posterior blepharitis

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Abstract

Purpose: To study the effect of posterior blepharitis on meibomian glands using infrared meibography and to correlate the results with tear film parameters.
Methods: This is a prospective cohort study. The study included eyes from two groups: 86 eyes of healthy volunteers' eyes and 72 eyes with posterior blepharitis. Participants were examined, and diagnosis of posterior blepharitis was achieved clinically based on signs of posterior blepharitis. Clinical assessment of dryness was performed including slit lamp examination looking for signs of posterior blepharitis, tear breakup time (TBUT), superficial punctate keratopathy (SPK), Schirmer II test (with anesthesia) and meibum score. Non-contact meibography was performed for both upper and lower eyelids using the meibo-grade system which involved distortion of meibomian gland, shortening and dropout.
Results: Lid margin abnormalities (Telangiectasia, lid margin swelling and hyperemia) were all significantly higher in the posterior blepharitis group. SPK, meibum score, meibography dropout, distortion, shortening, and total meibography were all significantly higher in the posterior blepharitis group as well as meibum score (P value < 0.001). TBUT was significantly shorter in the posterior blepharitis group (P value < 0.001). There was no significant difference between the two groups in Schirmer's II test.
Conclusion: Meibography can be a helpful non-invasive tool for the clinical evaluation of the extent of the anatomical damage in patients having meibomian glands loss due to posterior blepharitis. Knowing the extent of damage in meibomian glands may help in selecting the appropriate treatment modality and expect the response to treatment in patients with posterior blepharitis.

Keywords: Meibography, Blepharitis, Meibomian glands dysfunction

http://dx.doi.org/10.1016/j.sjopt.2017.05.014

Introduction

Blepharitis is a term that describes a wide group of disorders that cause an inflammation of eyelid margin and adjacent ocular surface. Eyelid margin anomalies consist of varied clinical entities which many of them have been identified as significant contributing factors to the dry eye syndrome.[1,2] Blepharitis is a common chronic disease whose etiology is poorly understood. It is a common eye condition and affects both children and adults.[2] Lindsley et al. categorized blepharitis in several different ways. The first group is based on the length of disease process: acute or chronic blepharitis while the second group is based on the anatomical location of the disease: anterior (e.g. staphylococcal and seborrheic blepharitis), and posterior blepharitis.[3]

McCann LC et al. showed significant differences in his study when he compared tear physiology and meibomian gland function in patients with blepharitis and normal

Received 30 April 2017; received in revised form 18 May 2017; accepted 26 May 2017; available online xxxx.

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Peer review under responsibility of Saudi Ophthalmological Society, King Saud University

Production and hosting by Elsevier

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patients without blepharitis using different clinical parameters such as tear evaporation rate which was higher in blepharitis group.[4] His study also demonstrated by meibography a significant meibomian gland dropout in blepharitis group with thicker and more opaque meibum.[4]

With the use of meibography, the structure of the meibomian glands, including the ducts and acini can be observed and assessed.[5] The non- contact meibography was introduced in 2008 by Arita et al.[6] In the non-contact meibography technique, the light and dark contrast of the meibomian glands is opposite that of contact technique in that they appear light instead of dark.

Our aim was to study the effect of posterior blepharitis on the function of meibomian glands and to assess and compare between meibomian glands in posterior blepharitis patients and normal population using infrared meibography and to correlate the results with tear film parameters.

Methods

After obtaining the approval of the Institution Review Board and obtaining a written informed consent from each participant, a prospective cohort study was performed on patients visiting King Abdulaziz University Hospital (KAUH) in Riyadh from April 2015 to April 2016. The study was conducted according to the principles contained in the Declaration of Helsinki.

The study included eyes from two groups: healthy volunteers' eyes and eyes with posterior blepharitis.

Exclusion criteria included contact lens wearers, systemic or ocular diseases that would interfere with tear film production or function, continuous eye drop use, eyes with sequelae of trachoma, facial nerve weakness and any eyelid surgery including cryotherapy or electrocautery treatment for trichiasis. The participants were examined, and the diagnosis of blepharitis was achieved clinically based on signs of blepharitis.

The clinical examinations of dryness and ocular surface were performed including slit lamp examination of the lids, conjunctiva and cornea were performed before and after fluorescein staining. Lid margin telangiectasia, lid margin swelling and lid margin hyperemia were noted. Tear breakup time (TBUT) was measured after fluorescein instillation and was represented by the time elapsed from the last complete eyelid blink until appearance of the first dry spot on the cornea. It was measured 3 times consecutively and the mean value was taken for analysis. Superficial punctate keratopathy (SPK) in the cornea was classified into four grades: no SPK anywhere on the cornea (grade 0); no SPK at the central cornea (grade 1), mild SPK at the central cornea (grade 2), and severe SPK at the central cornea (grade 3).[7]

Non-contact meibography was performed on both upper and lower eyelids separately, using the meibo-grade system which was developed and validated by Call et al.[8]. Normal morphology of the meibomian glands of the upper eyelids appears to be thinner and longer as compared with the lower eyelids which are broader and shorter. (Fig. 1 A and B). The meibo-grade system involves distortion of meibomian gland, shortening and dropout. Gland distortion is abnormal gland to tarsus ratio and/or tortuous glands and/or discordant pattering of glands (Fig. 2A). Gland shortening is gland not extending from the eyelid margin to the opposite edge of the tarsal plate (Fig. 2B). Gland dropout is zones of meibomian gland dropout (Fig. 2C). Each category was graded from 0 to 3 based on the extent of eyelid involvement: grade 0, no significant eyelid involvement; grade 1, less than 33% involved; grade 2, 33%–66% involved; grade 3, more than 66% involved. Then a maximal score of 9 represented complete gland dropout in the lid. Recorded video meibography image of each individual was used to evaluate the appearance of the meibomian glands.

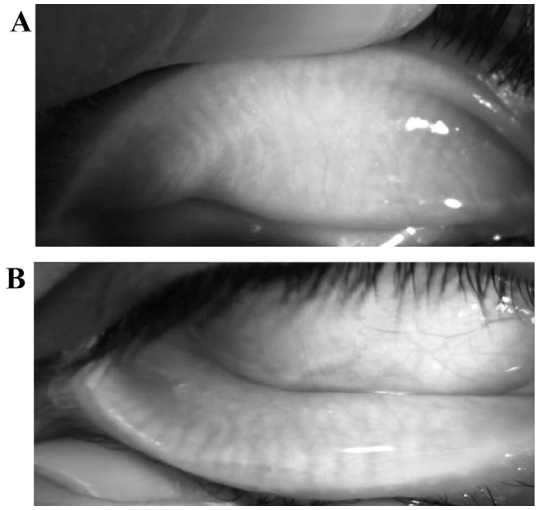

Fig. 1. (A) Meibography image of normal upper eyelid; meibomian glands are the dark thin and long vertical lines. (B) Meibography image of normal lower eyelid; meibomian glands appear to be broader and shorter compared to upper lid.

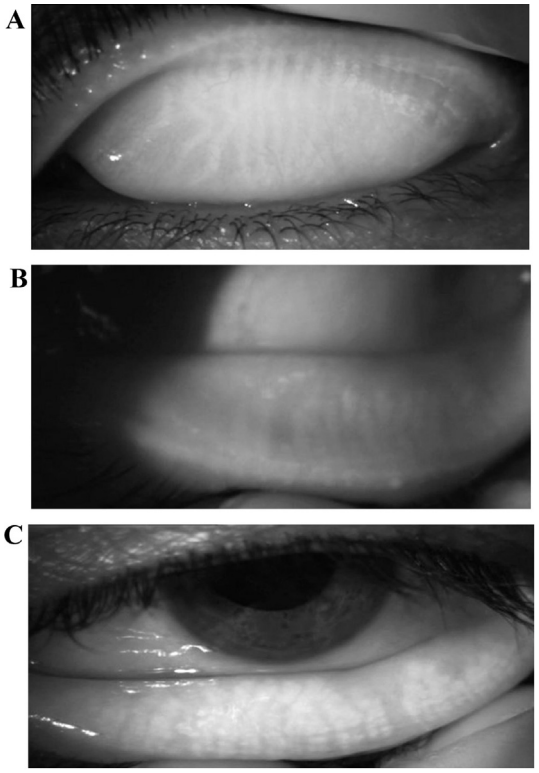

Fig. 2. (A) Meibography image of showing meibomian glands distortion and tortuosity (B) Meibography image showing meibomian glands shortening (C) Meibography image of showing meibomian glands dropout.

Please cite this article in press as: AlDarrab A., et al. Meibography for eyes with posterior blepharitis. *Saudi J Ophthalmol* (2017), http://dx.doi.org/10.1016/j.sjopt.2017.05.014