

Pai-Huei Peng, MD
Huang Man Ching, MD
Department of Ophthalmology,
Taipei Medical College Hospital

Original

Tear Film Lipid Layer Evaluation and The Relationship With Corneal Surface Regularity

Key Words

Meibomian gland dysfunction
Tearscope
Corneal topography

ABSTRACT

The purpose of this study was to evaluate if any correlation exists between corneal surface regularity and tear film stability. Twenty meibomian gland dysfunction (MGD) patients and 20 normal control subjects were enrolled. Corneal surface regularity (surface regularity index, SRI; surface asymmetry index, SAI) and topographic maps were evaluated with TMS corneal topography instrument. Tearfilm stability which included lipid layer patterns (open meshwork, wave , amorphous, and color fringe), and non-invasive break up time(NIBUT) was assessed with Keeler Tearscope-Plus. Tear film volume was measured using basic Schirmer's test. Patients with meibomian gland dysfunction had a lower percentage of symmetric bowei pattern and a higher percentage of irregular pattern on topographic maps than did normal groups. The SRI and SAI were elevated in the open meshwork group and reduced in the color fringe group when compared with normal subjects. The basic Schirmer test value and NIBUT were both lower in the open meshwork group. Lipid layer patterns and NIBUT observed under the Tearscope are valuable in assessing meibomian gland dysfunction patients. Combined application with other instruments can provide more information about the tear film status. (N. Taipei J. Med. 2000; 3:175-180)

INTRODUCTION

The tear film consists of 3 layers: a superficial lipid layer, a middle aqueous layer, and a basal mucous layer. Each layer has its specific functions. The lipid components are derived primarily from the meibomian glands and the gland of Zeis.¹ Meibomian gland dysfunction (MGD) results in altered or decreased lipid excretion that leads to qualitative and

quantitative changes in the tear film. Patients with MGD often suffer from red eyes, burning, irritation, dryness and fluctuating vision.

Clinically, there previously was no standard device to evaluate lipid layer structure. The Tearscope invented by Guillon² enables non-invasive 360° assessment of the superficial lipid layer by specular reflection. The cold-cathode light source produce less heat which can affect the tear film. The aims of this

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Correspondence: Dr. Pai-Huei Peng
Department of Ophthalmology, Taipei Medical College Hospital,
250 Wu Hsing Street, Taipei 110-31, Taiwan, R.O.C.
Tel: 886-2-2786-1288 ext. 8989; Fax: 886-2-2786-1288 ext. 8982