scores than did normal subjects (SRI: 0.43 ± 0.26, SAI: 0.21 ± 0.15) (Table 3). The open meshwork type had higher SRI (0.71 ± 0.43) and SAI (0.44 ± 0.3) scores when compared with the normal group.

The results of basic Schirmer test showed a low value in MGD patients for the open meshwork type (4 ± 2.93) (Table 4). There were no differences between MGD eyes and normal eyes in color fringe, wave, and amorphous patterns.

Table 5 demonstrates that NIBUT was only 9s' in MGD patients with open meshwork type tear film. NIBUT values in other patients were all greater than 20 s'.

DISCUSSION

Meibomian gland dysfunction is a common disorder found in out-patient clinics. It is associated with inflammation, obstruction, or abnormal secretion. The reduced or altered lipid excreta leads to tear film disruption with resultant irritation to the cornea, conjunctiva, and eyelids. Patients present with burning, redness, foreign body sensation and vision fluctuation. Although MGD has been recognized for a long time, its histopathology has not been well understood. Misdiagnosis as dry eye may occur.

The major functions of the superficial lipid layer include.[3]

(1) Prevention of evaporation. A 4-fold increase in the tear evaporation rate after removal of the lipid layer was found in rabbit eyes.[7] Craig and Tomlinson[8] in an in vivo study concluded that when the lipid layer is absent or not confluent, the tear film is unstable, and tear evaporation increases.
(2) Production of a smooth optic surface.
(3) Maintenance of the structual integrity of the ocular surface.

With the Tearscope, the tear film is visible over the entire cornea without using a coloring agent. Therefore, it is possible to observe tear film stability in its undisturbed state. According to Guillon grading system, the lipid layer patterns are classified into amorphous (most stable tear film), wave (average stability), open meshwork (thin and unstable tear film), and abnormal color fringe (reduced stability) groups. The lipid layer thickness varies from open meshwork (13-50 nm), wave (50-80 nm), and amorphous (80-90 nm), to color fringe groups (90-180 nm). Previous studies using various techniques reported lipid layer thickness as ranging from 32 to 102 nm.[9-12]

Corneal topography is an important exam for assessing corneal surface features such as shape, power and curvature. With presentation as color-coded maps, 6 patterns can be classified as round, oval, symmetric bowei, asymmetric bowei, kidney, and irregular types. Different distributions of topographic patterns in normal candidates were reported in previous studies. Different software instruments and different population selection lead to such variations. Our results show that the symmetric bowei type was found in 25% of color- coded maps in normal eyes, and the percentage dropped to 7.5% in eyes of MGD patients. Furthermore, more MGD patients presented an irregular pattern, though it was not significantly different. This might suggest that compositional changes or contamination of the lipid layer will disrupt uniform coverage and continuity of the tear film. So such a corneal surface loses its smoothness. The SRI and SAI can reveal quantitative characteristics of corneal surface topography. The SRI is determined from a summation of local power fluctuations along 256 equally spaced hemimeridians on the 10 central mires[13]. This index increases directly with increasing irregular astigmatism. The SAI is defined as the centrally weighted summation of differences in corneal power between corresponding points on individual photographic mires 180° Apart.[14] Values of SRI and SAI below 0.5 are considered normal. The lower SRI and SAI scores in the color fringe group and the higher index in the open meshwork group may be due to abnormalities in tear film thickness and smoothness. Liu and Pflugfelder[15] observed a more irregular topographic pattern and higher SRI and SAI scores in aqueous tear deficiency patients. However, after in-