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硕 士 学 位 论 文

视频终端使用者睑板腺状况的分析

Meibomian Gland Conditions in Visual Display

Terminal Workers

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摘 要

睑板腺是人体最大的皮脂腺，位于眼睑的上下睑板层，合成、储存并分泌脂质，构成泪膜的脂质层，具有重要的生理功能。睑板腺功能障碍（meibomian gland dysfunction, MGD）作为一种常见的眼表疾病，是蒸发过强型干眼的主要原因，常以腺体末端导管堵塞和/或睑板腺分泌物质和/或量的改变为特征。MGD患者的临床表现通常以长期、反复的眼部红痛、异物感、眼干涩等刺激症状为主，并无特异性，易被临床医生忽略。目前，临床上对于睑板腺形态的观察，主要有红外线睑板腺照相系统和激光共聚焦显微镜两种设备。

随着科技进步，视频显示终端（visual display terminals, VDT）的使用随之广泛应用，如电脑、平板电脑、视频操作屏幕，以及手机、游戏机等电子设备。随着电脑办公的普及，需要人们操作VDT的工作也越来越多。与VDT相关的健康问题也得到了人们的关注，长时间操作VDT，可引起眼部不适、骨骼肌肉系统疼痛、精神疲劳等一系列症候群，被称为“视频终端综合征”。其中眼部和视觉系统不适出现的概率最高，而干眼则是VDT使用者眼部不适症状的重要原因和研究热点。

本研究，主要针对长时间操作 VDT 并存在干眼症状的患者，通过观察其睑板腺的形态与功能来发现该人群中睑板腺状况与干眼观察指标的相互关系。

目的：应用红外线睑板腺成像设备观察长时间操作VDT并存在干眼症状的患者睑板腺的形态与功能变化。

方法：本研究为单中心、前瞻性、病例对照研究。选取2013年1月至2013年10月就诊于厦门大学附属厦门眼科中心的93例存在干眼症状的患者。将其分为两组：组1：长时间操作VDT，53例患者106只眼（VDT使用时间>4小时/天，且长于2年）组2：短时间操作VDT，40例患者80只眼（VDT使用时间≤4小时/天。且长于1年）。每一位患者均进行以下观察与评估：眼表疾病指数评估（Ocular Surface Disease Index, OSDI），泪膜破裂时间（tear film breakup time, BUT），角膜荧光素染色（corneal fluorescein staining），泪液分泌试验（Schirmer I test），裂隙灯下进行睑缘评估，睑脂（睑板腺分泌物）挤压试验，采用Keratograph 5M对睑板腺腺体缺失程度进行评分。

结果: 长时间组患者的OSDI和角膜荧光素染色评分明显高于短时间组, 而BUT长时间组明显低于短时间组, 但两组的泪液分泌试验并无显著性差别, 且两组的平均值均在正常范围内, 分别为 11.53 ± 8.32 和 12.88 ± 9.66 mm。在长时间组, 睑缘评分、睑脂评分、睑板腺缺失程度评分, 均明显高于短时间组, 差异具有统计学意义 ($P < 0.0001$)。为了进一步探索VDT使用者发生干眼症状中睑板腺功能异常的作用, 我们将长时间组的数据进行整理, 分为Schirmer < 10 mm (52只眼) 和Schirmer ≥ 10 mm (54只眼) 两个组, 发现包括OSDI, 角膜荧光素染色, BUT, MGD等3个评估指标 (睑缘评分、睑脂评分、睑板腺缺失程度评分) 均无明显的统计学差异。而相关分析显示, 睑缘评分、睑脂评分、睑板腺缺失程度评分与VDT操作时间、角膜荧光素染色具有显著的正相关性 ($P < 0.0001$), 与BUT具有显著的负相关性 ($P < 0.0001$), 但与泪液分泌试验无明显的相关性。

结论: 干眼在视频终端使用者中较为多见, 是造成该类人群眼部不适症状的重要原因。长时间使用视频显示终端, 可引起睑板腺结构与功能的异常, 即MGD, 但对于泪液分泌量的影响较小, 睑板腺功能异常可能决定了VDT操作者眼部不适症状与干眼的严重程度。相对于泪液分泌量的改变, VDT对睑板腺的影响可能更早、更快、更严重。因此, 在干眼病的诊断与治疗过程中, 需强调对于睑板腺形态与功能的检查。

关键词: 睑板腺; 红外线; 显微镜检查, 共焦; 睑板腺功能障碍; 干眼; 视频显示终端

Abstract

The sebaceous meibomian glands(MG) in the eyelids, that synthesis, storage and secrete lipids for the superficial tear film layer, play an important role in maintaining a healthy ocular surface. Meibomian gland dysfunction (MGD) is one of the most commonly ocular surface disease in clinical practice, but the symptoms of MGD have no specificity, the consideration and examinations of meibomian gland abnormalities were easy to neglected by ophthalmologists. In the year of 2011, the international workshop had published the definition of MGD; a chronic, diffuse abnormality occurs in meibomian glands, the features are terminal duct obstruction and/or qualitative/quantitative changes in the meibomian gland secretion (meibum). MGD may affect the tear function; evoke ocular discomfort symptoms and ocular surface inflammation and other diseases. Abnormalities in meibomian gland morphology can lead to meibomian gland dysfunction, which can be the cause of evaporative dry eye. The observation techniques and appliances of meibomian gland morphology in clinic are meibography and in vivo laser scanning confocal microscopy (LSCM) at present.

With the advances of science and technology, visual display terminals (VDT) has been increasingly used, such as computers, tablet computers, video operation screen, as well as mobile phones, and other digital electronic devices. Working related to visual display terminals is also increasing dramatically in this global information age. The overwhelming prevalence of VDT evoke human concerned about the accompanied health problems, long time VDT using has been shown to be associated with ocular discomfort and vision problems, musculoskeletal disorders, and mental health, these syndromes were named as “visual display terminal syndrome”. The ocular and vision discomfort are the most common complaints among VDT users. Dry eye was considered a significant contributor to the ocular symptoms in VDT users.

The development of ocular complaints among VDT workers was also reported to be correlated with the meibomian gland dysfunction.

The present study evaluated the morphologic characteristics and function of meibomian glands using this non-contact imaging device in a relatively large population of VDT workers. This clinical investigation for the first time revealed an important phenomenon that meibomian gland dysfunction not only associates but also determines the severity of the dry eye conditions in long term workers at visual display terminal.

Propose:

To explore an interesting phenomenon and mechanism that meibomian gland dysfunction (MGD) may determine the severity of the ocular discomfort and dry eye conditions in visual display terminal (VDT) workers with normal tear volumes.

Methods:

One hundred and six eyes of 53 consecutive patients working at a VDT for more than 4 hours a day were recruited for this study (Long time VDT group). Eighty eyes of 40 age- and gender-matched patients working at a VDT for less than 4 hours a day were served as controls (Short time VDT group). After completion of an Ocular Surface Disease Index (OSDI) questionnaire, the following tests were performed: tear film breakup time (BUT), corneal fluorescein staining score, tear production by Schirmer test without topical anesthetic, a slit-lamp examination of the lid margin abnormality and meibum expression, and an evaluation of the meibomian glands by Keratograph 5M.

Results:

The dry eye indexes, OSDI and fluorescein staining score were significantly higher while the tear film BUT was dramatically shorter in the long VDT group than that in the short VDT group. However, the average of tear volumes measured by Schirmer test were in the normal ranges in both groups, 11.53 ± 8.32 and 12.88 ± 9.66 mm, respectively. Interestingly, the lid margin abnormality score, meibum score, and meiboscore were significantly higher in the long VDT group than the short VDT group ($P < 0.0001$). When the low and normal tear groups were separated from the long VDT workers, 52 eyes with Schirmer < 10 mm, and 54 eyes with Schirmer ≥ 10 mm, no significant difference was found between the two subgroups in OSDI,

fluorescein staining and BUT, as well as the lid margin abnormality score, meiboscore, and meibum score. Spearman analysis further revealed that all 3 MGD scores were positively correlated with VDT working time ($P < 0.0001$) and fluorescein scores ($P < 0.0001$), inversely correlated with BUT ($P < 0.05$), but not correlated with Schirmer values, in VDT workers.

Conclusions:

In conclusion, this study revealed that long time VDT workers who suffered ocular discomfort and dry eye syndrome without significant aqueous tear volume deficiency, but with significant alterations in meibomian gland morphology and function, suggesting that meibomian gland function is responsible for the severity of dry eye conditions in these patients. Moreover, longer durations of VDT work may cause MGD earlier, faster, or more severe than tear volume deficiency. Therefore, the examination of meibomian gland morphology and function, especially meibography, may provide early diagnostic and therapeutic values in dry eye disease.

Key words:

Meibomian glands; Infrared Rays; Microscopy, Confocal; Meibomian gland dysfunction; Dry eye; Visual display terminal

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