

Short Communication

Daily Habits to Maintain Ocular Surface Health: Internet Survey on Eyelid Cleaning

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ABSTRACT

Importance: Dry eye and meibomian gland dysfunction are largely modern diseases, having recently increased in incidence, and it is an important public health problem. Although, proper eyelid care will ensure the health of the ocular surface, its habit in general population has not previously been reported.

Observation: In this brief report, we sought to determine the extent to which the general Japanese population had adopted eyelid hygiene habits. We conducted an Internet survey designed to investigate the awareness of eyelid hygiene in Japan and we received 1055 responses. This web-based survey was administered in 2014.

Conclusion and relevance: The percentage of respondents who reported consciously cleaning their eyelids daily (23%) was low. In particular, the disease “Meibomian gland dysfunction”, which is a major cause of dry eye, is hardly recognized (2%) amongst the general population. Furthermore, more than half of the respondents reported having some ocular symptoms. Public education efforts should attempt to raise awareness of lid hygiene, as it is the mainstay of treatment for ocular surface diseases and may be sufficient for their control. Eliminating poor hygiene habits can result in a healthy ocular surface.

Keywords: Eye; Dry eye; Lid hygiene; Meibomian gland dysfunction; Ocular health

How this fits in with quality in primary care?

What do we know?

Dry eye and meibomian gland dysfunction are increasing in prevalence worldwide, and are becoming a public health problem. There have been numerous public education programs regarding the importance of dental hygiene, but very few regarding eyelid hygiene.

What does this paper add?

In a Japanese study population, we found that participants generally had dental hygiene habits, but were much less familiar with meibomian gland dysfunction and the need for proper eyelid hygiene. This suggests that more public education is needed to raise awareness of lid hygiene.

Introduction

Modern societal habits sometimes involve a heavy application of cosmetics to the eyelid margin and the use of contact lenses, potentially introducing irritants to the ocular surface. Furthermore, the time spent each day focusing on screens (computer, smartphone and TV) has increased in modern life, which is a strong risk factor for dry eye disease.¹ Dry eye and meibomian gland dysfunction are largely modern diseases, having recently increased in incidence. It has been reported that more than 70% of Japanese adults over the age of 60 years have dry eye.² Shimazaki et al. reported that 64.6% of patients with ocular discomfort had meibomian gland dysfunction.³ The increasing prevalence of dry eye disease worldwide is an important public health problem, especially in developed countries with advanced information technology and in those with an aging population.

In the meantime, with the increased consumption of sugar in modern diets, the incidence of dental caries has increased.

Therefore, daily tooth brushing has become standard practice and the general population is aware of the importance of dental hygiene. Proper dental care ensures the health of the teeth. We believe the same holds true regarding the health of the eye.

Thus, we sought to determine the extent to which the general Japanese population had adopted eyelid hygiene habits that can prevent and manage ocular surface diseases.

Methods

We conducted an Internet survey designed to investigate the awareness of eyelid hygiene in Japan, and we received 1055 responses. This web-based survey was administered in 2014 (Supplementary Tables 1-5). The sample consisted of consenting members of the Japanese general population aged 20–69 years, recruited through a survey company (FULLTIME CO. LTD., Tokyo, Japan). This company maintains a panel of potential survey participants; these individuals are periodically invited to complete online surveys in exchange for small amounts of compensation via a generic recruitment email. Quotas were used to ensure an equal

proportion of men and women, and equal proportions of ages. For the statistical analysis, Fisher's exact test was used to test for differences between the participants' habit of brushing their teeth daily and their habit of cleaning their eyelids daily. Multivariate logistic regression analysis was conducted with explanatory variables of age and sex, and an objective variable of the habit of cleaning their eyelids daily. Odds ratios (OR) with 95% confidence intervals (95% CI) were calculated in the multivariate logistic regression analysis. All analyses were performed using JMP Ver. 12.0 (SAS Institute Inc., Cary, NC, USA), and the level of significance was set at 5% on both sides.

This research followed the tenets of the Declaration of Helsinki, and the protocol was approved prospectively by the Ethical Review Board of the Keio University School of Medicine, Tokyo, Japan.

Results and Discussion

As shown in Figure 1, we found that the percentage of

respondents who reported consciously cleaning their eyelids daily (23%) was low compared with those who were in the habit of brushing their teeth daily (98%) [$p < 0.0001$; Fisher's exact test]. This indicates that while the importance of dental hygiene is already widely recognized among the general population, little is known about lid hygiene. In other words, people are aware that dental care prevents dental caries, but do not understand why lid hygiene is necessary. In particular, the disease "Meibomian gland dysfunction", which is a major cause of dry eye that can be prevented with proper lid hygiene, is hardly recognized amongst the general population (Figure 2).

Then, using a multivariate logistic regression analysis, age and sex were found to be significant factors for the habit of daily eyelid cleaning ($p = 0.0172$ OR: 0.98 [95% CI: 0.97–0.99] and $p < 0.0001$ OR: 0.21 [95% CI: 0.14–0.29], respectively). These results indicate that men are less likely to clean their eyelids daily than women, and that older participants were less likely to have a daily habit. As a study limitation, because the survey

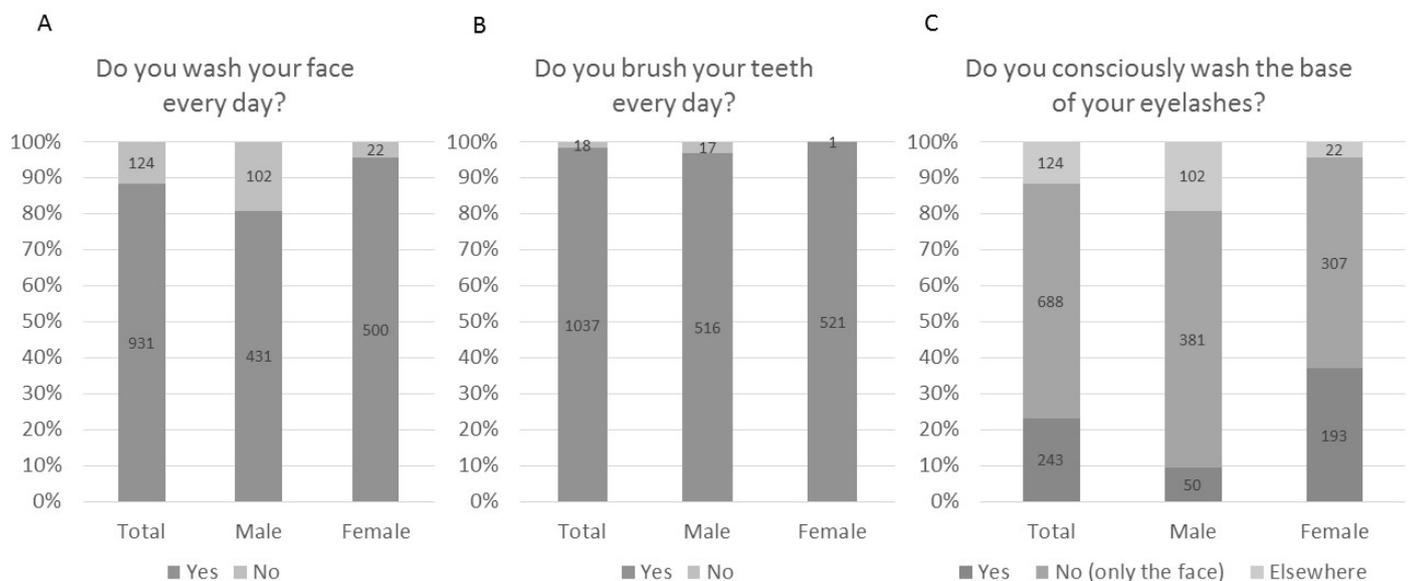


Figure 1: Habits of facial, eyelid, and dental hygiene.

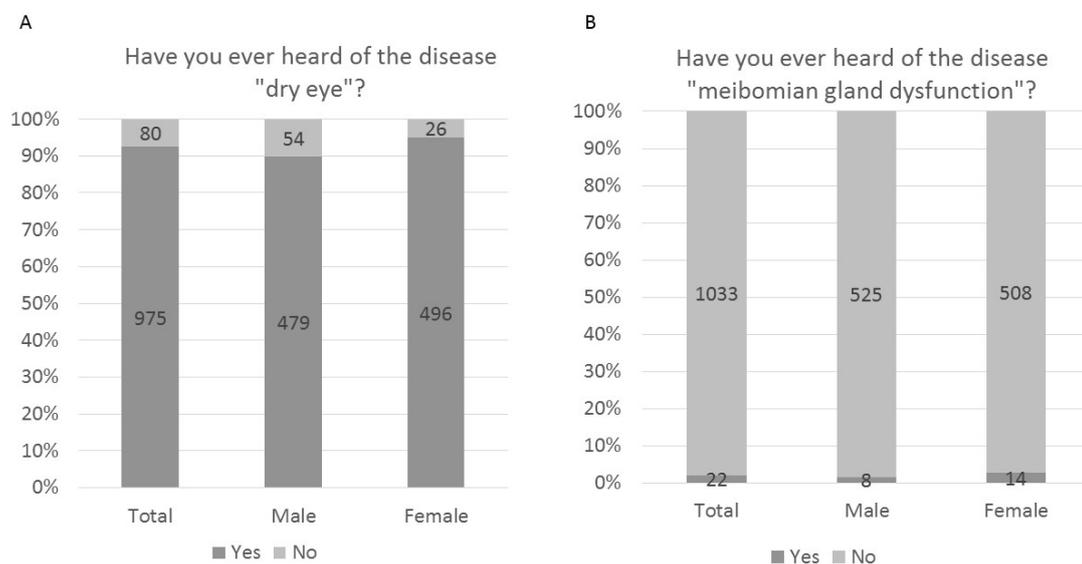


Figure 2: Recognition of dry eye disease and Meibomian gland dysfunction.

was conducted over the internet the study population might not be a good representation of the general population; people who do not use the internet regularly (in particular, older age), might have much poorer eyelid hygiene habits.

More than half of the respondents reported having some ocular symptoms (Figures 3A-3D), and 92% were familiar

with the term “dry eye disease” (Figure 2B). However, only 9% reported seeking medical care and using prescribed eye drops (Figure 3E). These results suggest that the number of potential dry eye patients is large.

Among the female respondents, over 45% considered the eyes to be the focal point for facial cosmetics; 10% of women in their

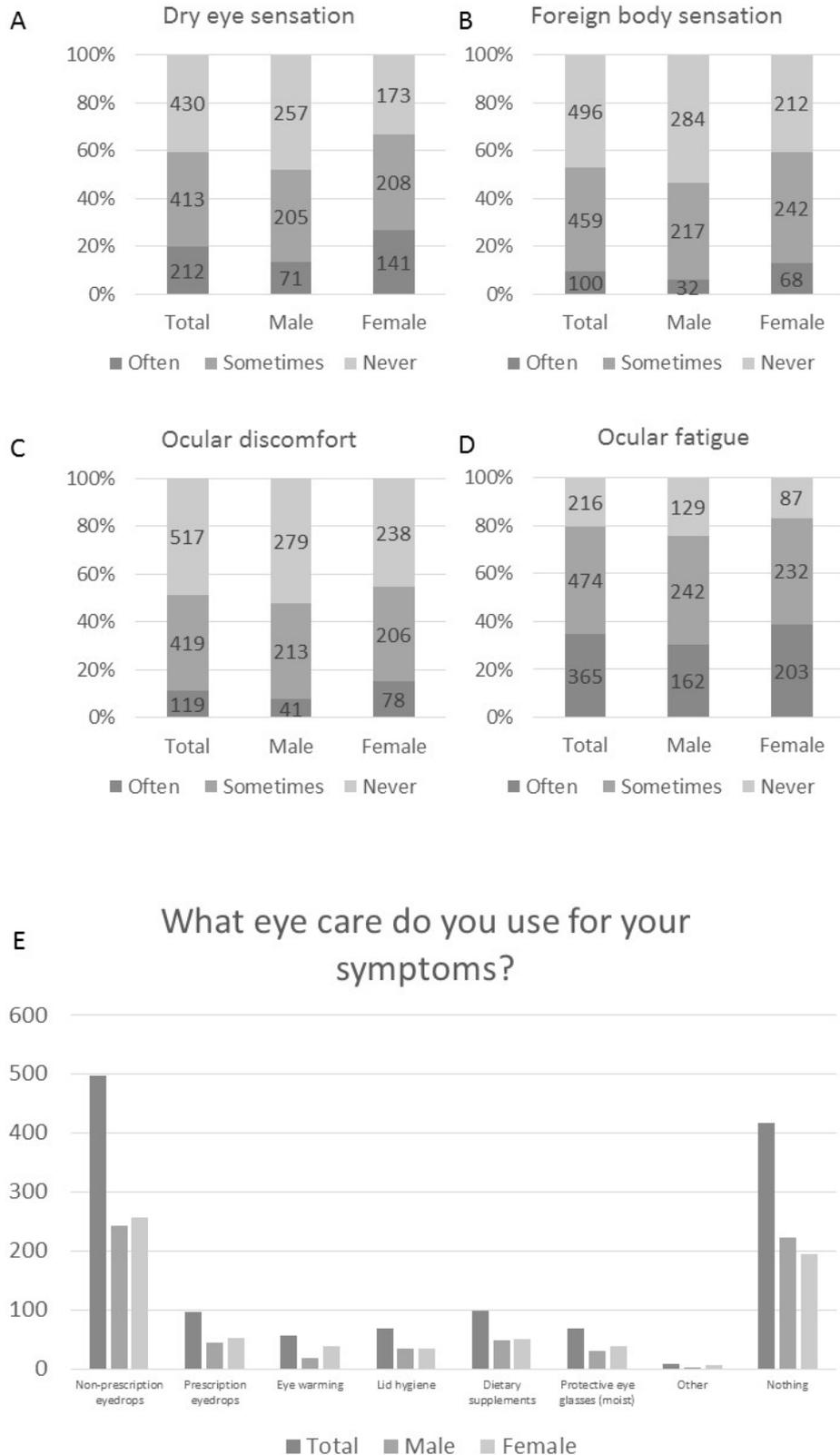


Figure 3: Ocular symptoms and eye care status.

20's applied eyeliner to the inner lid margin; and about 25% reported often or sometimes going to bed still wearing make-up. These results seem to indicate increased risk factors for ocular surface diseases such as blepharitis and meibomian gland dysfunction in a population generally unaware of these problems.

Published studies have reported that lid hygiene is important to ocular surface health. Recently, Han et al. reported an increased incidence of dry eye and meibomian gland dysfunction after cataract surgery.⁴ Lid hygiene may reduce the incidence of postoperative ocular surface diseases. The incidence of blepharitis can also be reduced by proper lid hygiene.⁵ Patients should be instructed to keep their lids and lid margins clean in order to prevent or treat blepharitis, meibomian gland dysfunction and dry eye. This could be done by care managers and other allied health professionals, in collaboration with general physicians.⁶ This can be also improved by patient education and physician training.

Public education efforts should attempt to raise awareness of lid hygiene, as it is the mainstay of treatment for ocular surface diseases and may be sufficient for their control. Lid hygiene should also be maintained regardless of the need for additional treatment. Eliminating poor hygiene habits can result in a healthy ocular surface.

Ethical Approval

This study was approved prospectively by the Ethical Review Board of the Keio University School of Medicine, Tokyo, Japan.

SOURCE OF FUNDING

This work was supported by the Dry Eye Society. The

funding organization had no role in the design or conduct of this research. The authors have no proprietary or commercial interest in any of the materials discussed in this article.

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Submitted: August 07, 2015; Accepted: August 24, 2016; Published: August 31, 2016