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Compliance and subjective patient responses to eyelid hygiene

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Abstract

Objectives—Lid hygiene is a commonly prescribed first-line therapy in patients with lid margin disease, yet compliance with therapy is not well characterized. The goals of this study were to assess patient compliance with lid hygiene and evaluate which factors predict a favorable symptomatic response to treatment.

Methods—This was a cross-sectional study of patients seen in the Miami Veterans Affairs eye clinic between August and December 2014. An evaluation was performed to assess dry eye symptoms and lid margin signs. All patients were then instructed to perform warm compresses and lid scrubs. A follow-up phone survey assessed compliance and subjective therapeutic response 6 weeks later.

Results—Two hundred and seven of 211 (98%) patients (94% male, 60% white) completed the survey. Of the 207 patients, 188 (91%) completed the follow up survey. Compliance with therapy was reported in 104 patients (55%); 66 reported complete improvement, 30 partial improvement, and 8 no improvement in symptoms. Patients who self-reported dry eye symptoms at first visit (n=86, 74%) were more likely to be compliant with lid hygiene than those that did not report symptoms (n=18, 25%) ($p<0.0005$). The only factor associated with poorer response to lid hygiene was longer time of self-reported dry eye symptoms. None of the other signs studied, including presence of skin rosacea and lid margin telangiectasia, were associated with a differential response to lid hygiene.

Conclusions—Patients with dry eye symptoms were moderately compliant with lid hygiene, and patients who performed the routine noted improvement in symptoms.

Keywords

Dry eye; lid hygiene; lid margin

INTRODUCTION

Lid margin disease is a commonly encountered disorder in eye care practices. Its symptoms can range from none to severe; its signs are diverse and include stigmata of anterior

blepharitis (collarettes, crusting of eye lashes) and posterior blepharitis (lid telangiectasias, abnormal meibum quality).¹ Some of these patients have further evidence of evaporative dry eye.^{2,3} Independent of the specific findings, lid hygiene is often recommended as a first line therapy in patients with lid margin disease.

The goal of lid hygiene is to remove inflammatory debris from the eye lid margin and improve tear film stability by improving lipid layer health.⁴ Various forms of lid hygiene have been described. The simplest regimens consist of warm water compresses alone or in combination with baby shampoo lid scrubs applied with a wash cloth, cotton pad, or cotton tip applicator. Alternative warm compresses can include socks filled with rice heated in the microwave or commercially available heating pads. These can increase heating time beyond that achieved with warm water.⁵ Over-the-counter lid scrubs, such as OcuSoft (Rosenberg, Texas), Eye Scrub (Novartis, Switzerland), LidHygenix (Advanced Eye Care Products, Inc. Atlanta, GA), Sterilid (Advanced Vision Research, Ann Arbor, MI), Blephaclean (SpectrumThea, UK), and others are sometimes used in lieu of baby shampoo.⁶

Several studies have evaluated outcomes after various lid hygiene routines and overall the data supports the use of lid hygiene for the treatment of lid disease.⁷ While lid hygiene is a commonly prescribed therapy, what remains unknown are the utilization and outcomes of lid hygiene in a clinical setting. Do patients actually do the prescribed therapy? As such, this study was conducted to assess patient compliance with lid hygiene and evaluate the influence of initial objective lid findings on subjective patient satisfaction with therapy.

MATERIALS AND METHODS

The Miami Veterans Affairs (VA) eye clinic serves veterans with specific eye problems along with those needing surveillance due to medical conditions (e.g. diabetes). All patients seen in the Miami VA comprehensive eye clinic (1 day a week, August 25 to December 19, 2014) were evaluated. The VA ophthalmology service initiated this study as a quality improvement project. Miami VA Institutional Review Board review and approval was later obtained to review the collected data. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Patients were invited to complete a 19-question survey administered by the treating physician at the time of their visit. The survey collected patient information regarding demographics, past ocular and medical history, and medication information and assessed for dry eye symptoms. Patients also completed the dry eye questionnaire 5 (DEQ5), score range 0–22, to assess for symptoms of dryness, discomfort, and tearing.⁸ Following the survey, all patients underwent an assessment evaluating for features of lid disease. The presence of anterior blepharitis, eyelid vascularity, and inspissation were all graded on a scale of 0 to 3 (0=none, 1=mild, 2=moderate; 3=severe). Meibum quality was graded based on a scale of 0 to 4 (0 = clear; 1 = cloudy; 2 = granular; 3 = toothpaste; 4 = no meibum extracted).⁹ Corneal staining was graded on a scale from 0 to 5 based on the Bron scale.¹⁰ The clinician also examined the facial skin and documented the presence of ocular rosacea based on the following criteria: Flushing (transient erythema), papules, pustules, comedones, and

telangiectasia. Severity was graded on a scale of 0 to 3 (0=none, 1=mild, 2=moderate; 3=severe). Data were entered into a standardized database.

Following evaluation all patients were given standardized instructions for lid hygiene. Patients were instructed to apply warm compresses to the eyelids for 5 minutes twice daily followed by an eyelid scrub with warm water. Baby shampoo was recommended for the eyelid scrub but was not required. Warm compresses and lid hygiene were recommended as dual therapy as they are frequently prescribed together, although they may treat anterior and posterior blepharitis differently.¹¹ A follow up phone call was then conducted 6 weeks after the clinical visit to assess patient compliance and satisfaction with the therapy. Specific questions asked during this follow up phone call were compliance with therapy and subjective improvement in symptoms in those compliant with therapy.

All statistical analyses were performed using the SPSS 21.0 (SPSS Inc, Chicago, IL) statistical package. Frequencies and descriptive statistics were applied to the data, as appropriate. Student t, Mann Whitney U, analysis of variance, and chi square analyses were used, as appropriate, to compare findings between groups.

RESULTS

Of the 211 patients seen over a period from August 25 to December 19, 2014, 207 (98%) completed the survey. The mean age of the 207 study patients was 69 years (standard deviation (SD) 10.6) (Table 1). A majority of the patients were male (94%) and white (60%). Sixty-one percent of patients reported having dry eye symptoms, and in those patients, symptoms were present on average for 4.5 years (range 1–50 years, SD 6.8 years). The mean DEQ5 score for all patients was 5.5 (range 0–20, SD 5.2) and, as expected, those who self-reported dry eye symptoms had higher DEQ5 scores (mean 8.1 SD 4.7) than those that did not report dry eye symptoms (mean 1.5 SD 2.9) ($p<0.0005$). One hundred ninety six patients (95%) had at least one ocular sign graded as 1 or greater on any of the measured parameters. Skin rosacea was noted on examination in 79 patients (38%) and as expected the majority ($n=78$) of these patients self-characterized themselves as white.

Patient compliance

All patients were given a standardized protocol for performing lid hygiene and a telephone call was made 6 weeks later to assess compliance and effect. In all, 188 of the original 207 patients (91%) were able to be re-contacted and 104 reported compliance with therapy (55%), 56 with water alone and 48 with water and baby shampoo. Reasons for noncompliance included inconvenience in 9, forgetfulness in 28, and feeling that they didn't need therapy in 47. Of note, no patient stated that lid hygiene worsened dry eye symptoms.

Eighty-six of the 104 patients who reported compliance with lid hygiene had self-reported dry eye symptoms at first visit (74%) while 18 patients (25%) reported no dry eye symptoms ($p<0.0005$). Interestingly, demographic factors, skin rosacea, and ocular signs did not influence compliance with therapy (data not shown). Those with a diagnosis of glaucoma were less likely to stay compliant with therapy than those without such a diagnosis, but the effect did not reach statistical significance (24% ($n=25$) versus 36% ($n=30$), $p=0.07$).

Subjective satisfaction with lid hygiene therapy

Of the 104 patients that reported compliance with therapy, only 8 reported that the lid hygiene did not help with symptoms. The remaining 96 patients reported improvement in symptoms: 66 total and 30 a partial improvement. As summarized in Table 2, the only factor found to significantly associate with a poorer response to lid hygiene was a longer time of reported dry eye symptoms. Those that stated they had no response to therapy reported having dry eye symptoms for 7.8 years, compared to 5.8 year in those with a partial response, and 2.7 years in those with a total response, $p=0.02$. There was no difference in response by the type of symptom reported (blurry vision, pain, or tearing). Patients with severe dry eye symptoms (DEQ5 = 12) were as likely to report complete improvement in dry eye symptoms as those without (61% vs 64%, $p=0.55$). There was also no difference in response between patients who used water versus baby shampoo (no improvement 11% vs 4%, somewhat improved 21% vs 38%, total response 68% vs 58%; $p=0.13$). None of the other signs studied, including the presence of skin rosacea (both examined in a binary fashion and graded by severity), were significantly associated with a differential response to lid hygiene.

DISCUSSION

Lid margin disease is a heterogeneous group of conditions with a variety of clinical signs including anterior findings (crusting on lashes) and posterior findings (telangiectasias, solidified meibum, atrophy of meibomian ducts). These changes can be associated with other clinical signs of dry eye including corneal staining and rapid tear evaporation and may be associated with various dry eye symptoms. While lid hygiene is a commonly recommended routine for those with lid disease, we found that compliance with therapy was only moderate in patients with self-reported dry eye symptoms, and expectedly poor in those without symptoms. Similar to a prior study, clinical signs of lid disease were not found to influence subjective patient response to therapy.¹² The known discordance between clinical signs and symptoms of dry eye^{3,13} may underlie a similar lack of association between initial ocular surface signs and satisfaction with lid hygiene therapy.

Only three prior studies specifically commented on compliance with lid hygiene measures. One study of 40 patients with dry eye symptoms (ocular surface disease index score = 13) and eyelid margin findings examined compliance with Blephaclean scrubs twice daily for two weeks then daily for 3 months.¹⁴ They found that patients reported near perfect compliance with both the twice daily and daily regimens. A second study evaluated 3 different regimens (linoleic acid, lid hygiene, both) in 57 patients with MGD. Of the 38 patients who performed lid hygiene, 5% of patients dropped out of the study by 60 days and 13% at 180 days.¹⁵ A third study enrolled 37 patients with dry eye diagnosed based upon subjective complaints and eyelid margin signs. The patients were instructed to perform warm compresses and lid hygiene measures four times daily for two weeks, then twice daily for four weeks; 70% of patients reported compliance after 6 weeks of therapy.¹⁶ Of these studies, only the third questioned patients on their reasons for non-compliance, finding that patients most frequently reported that they were unable to comply with the regimen or did

not experience significant improvement in symptoms. Our finding of a 74% compliance frequency in those with dry eye symptoms was most similar to the third study.

Many studies, on the other hand, have evaluated the effectiveness of lid hygiene routines.^{5,14–23} These studies have looked at conservative management as a primary treatment or as a control to novel treatment paradigms. All but two^{18,23} showed improvement in dry eye symptoms with conservative management. All showed varying degrees of improvement in objective parameters, with improvement most commonly seen in meibomian gland expression and quality.^{5,14,15,18–21,23} Tear film parameters such as tear break up time and Schirmer's improved less frequently.^{5,16,23} One study reported that improvement in tear break up time (TBUT) positively correlated with improvement in symptoms.⁵ However, no study reported how pre-treatment clinical signs or symptoms influenced response to therapy.

Interestingly, we found that no specific sign or symptom of lid disease was associated with a poorer (or better) response to therapy. We initially hypothesized that those with skin rosacea or lid telangiectasia may do less well with lid hygiene, as the neurovascular and neuroimmune aspects of their disease may be exacerbated by mechanical manipulation.²⁴ Despite our limited power, this was not seen as patients with these characteristics were just as likely to be compliant with therapy and just as likely to report subjective satisfaction.

As with all studies, the current work has limitations that need to be considered. First, we assessed compliance and subjective responses to treatment 6 weeks after receiving instructions for lid hygiene. As such, it is possible that our findings would have been different with a different ascertainment point. Second, our main outcome variables were assessed by patient self-report and not on a follow up visit that simultaneously examined clinical signs. As such, we cannot comment on the effect of therapy on the clinical signs of disease. We would argue, however, that symptoms are the most bothersome aspect of disease and the one that reduce quality of life. Third, there was no comparative control group that was not instructed to perform lid hygiene so the reported results may represent observation bias. Fourth, we examined several but not all parameters associated with lid disease. Parameters not evaluated included tear break up time (TBUT), osmolarity, and lipid thickness. As this study was started as a quality assurance project and run through the regular eye clinic, the tests chosen were ones that could be performed after an assessment by a technician and after eyedrop placement. Fifth, our findings are specific to the lid hygiene regimen we instructed which did not include any commercially available products and was not tailored to anterior versus posterior blepharitis. Finally, results from our patient population, which consists of older, mostly male US veterans seeking eye care services, may not be generalizable to other dry eye populations, including female patients.

Despite these limitations, our results are important as they reinforce the role of lid hygiene as a first line therapy in patients with lid margin disease. Lid margin disease can be a frustrating entity to treat, both for patients and physicians, and it is encouraging that most patients, including those with skin rosacea, had symptomatic relief from treatment. Patient compliance is an issue, however, and further studies are needed to understand which tips and instructions are most likely to lead to increased patient compliance.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Demographic and clinical features of the study population (n=207)

Demographics	
Age, mean (SD)	69 (10.6)
Gender, n (%) male	194 (94%)
Race, n (%) white	124 (60%)
Ethnicity, n (%) Hispanic	37 (18%)
Co-Morbidities	
Glaucoma, n (%)	71 (34%)
Self-reported dry eye symptoms, n (%)	126 (61%)
Severe dry eye symptoms by DEQ5 (score 12)	38 (18%)
Most bothersome symptom of dry eye, if applicable, n (%)	
Visual disturbance	50 (24%)
Pain (e.g. dryness, burning, aching)	34 (16%)
Tearing	44 (21%)
Rosacea diagnosed by physician, n (%)	10 (5%)
Rosacea diagnosed by clinical examination during visit	
Mild, n (%)	53 (26%)
Moderate, n (%)	22 (11%)
Severe, n (%)	4 (2%)
Medications	
Artificial tears, n (%)	91 (44%)
Lid hygiene, n (%)	24 (12%)
Glaucoma medications, n (%)	59 (29%)
Prostaglandin analogs, n (%)	49 (24%)
Eyelid and corneal findings	
Anterior blepharitis, mean (SD)	0.78 (0.77)
Eyelid vascularity, mean (SD)	0.86 (0.92)
Meibum inspissation, mean (SD)	1.22 (0.90)
Meibum quality, mean (SD)	1.75 (1.37)
Corneal staining, mean (SD)	1.15 (1.25)

SD=standard deviation; n=number in group

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Table 2

Demographic and clinical features by treatment response of patients who were compliant with the lid hygiene routine (n=104)

Demographics	No improvement	Partial improvement	Complete improvement	P-value
Age, mean (SD) [n]	69 (4) [8]	69 (11) [30]	68 (11) [66]	0.86
Gender, male % (n)	8% (8)	28% (27)	64% (61)	0.64
female % (n)	0% (0)	37.5% (3)	62.5% (5)	
Race, white % (n)	7% (5)	31% (21)	62% (42)	0.82
black % (n)	8% (3)	25% (9)	67% (24)	
Ethnicity, non-Hispanic % (n)	2 (10%)	24% (5)	67% (14)	0.82
Hispanic % (n)	6 (7%)	30% (25)	63% (52)	
Co-Morbidities				
Glaucoma, Yes % (n)	12% (4)	27% (9)	61% (20)	0.51
No % (n)	6% (4)	30% (21)	65% (46)	
DEQ5 score, mean (SD) [n]	8.0 (7.5) [8]	6.7 (4.9) [30]	6.7 (4.9) [66]	0.78
DEQ5 12, Yes % (n)	13% (3)	26% (6)	61% (14)	0.55
No % (n)	6% (5)	30% (24)	64% (52)	
Duration of symptoms (in those with symptoms) mean (SD) [n]	7.8 (9.8) [5]	5.8 (7.0) [28]	2.7 (3.6) [53]	0.02
Rosacea, Yes % (n)	4.5% (2)	36% (16)	59% (26)	0.26
No % (n)	10% (6)	23% (14)	67% (40)	
Medications				
Artificial tears, Yes % (n)	7% (4)	37% (22)	57% (34)	0.14
No % (n)	9% (4)	19% (8)	72% (31)	
Glaucoma medications, Yes % (n)	16% (4)	20% (5)	64% (16)	0.15
No % (n)	5% (4)	32% (25)	63% (50)	
Prostaglandin analogs, Yes % (n)	14% (3)	23% (5)	64% (14)	0.44
No % (n)	6% (5)	31% (5)	63% (52)	
Eyelid and corneal findings				
Anterior blepharitis, mean (SD) [n]	0.63 (0.52) [8]	0.83 (0.87) [30]	0.71 (0.80) [66]	0.73
Anterior blepharitis 2, Yes % (n)	0% (0)	37% (7)	63% (12)	0.32
No % (n)	9% (8)	27% (23)	64% (54)	
Eyelid vascularity, mean (SD) [n]	0.75 (0.89) [8]	1.23 (1.04) [30]	0.88 (0.98) [66]	0.22
Eyelid vascularity 2, Yes % (n)	7% (2)	33% (10)	60% (18)	0.81
No % (n)	8% (6)	27% (20)	65% (48)	
Inspissation, mean (SD) [n]	1.75 (1.04) [8]	1.33 (1.06) [30]	1.11 (0.86) [66]	0.14
Inspissation 2, Yes % (n)	8% (3)	31% (11)	61% (22)	0.94
No % (n)	7% (5)	28% (19)	65% (44)	
Meibum quality, mean (SD) [n]	1.63 (1.51) [8]	2.07 (1.41) [30]	1.58 (1.33) [66]	0.26
Meibum quality 2, Yes % (n)	4% (2)	33% (17)	64% (33)	0.28

Demographics	No improvement	Partial improvement	Complete improvement	P-value
No % (n)	11.5% (6)	25% (13)	63.5% (33)	
Corneal staining, mean (SD) [n]	1.50 (1.31) [8]	1.13 (1.17) [30]	1.29 (1.36) [66]	0.75
Corneal staining 2, Yes % (n)	5% (2)	30% (11)	65% (24)	0.81
No % (n)	9% (6)	28% (19)	63% (42)	

SD=standard deviation; n=number in group