Intense pulsed light treatment for moderate to severe acute blepharitis/blepharoconjunctivitises

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Abstract

Background: The aim was to evaluate the efficacy of periorcular intense pulsed light therapy in the treatment of moderate to severe acute blepharitis/blepharoconjunctivitis.

Methods: This single-institution, retrospective study involved 11 patients who received bilateral treatments using an intense pulsed light device (E Eye, Elswin, Paris, France) at baseline, week 2 and 6. Clinical evaluations provided data on symptoms (ocular surface dryness and discomfort); signs (hyperemia, conjunctival injection, telangiectasia and chemosis). Data were analyzed using the Friedman test with the Wilcoxon signed rank test for paired samples. Significant differences were identified when p < 0.05.

Results: Significant improvements were noted in symptom and sign scores for all patients after the treatment period. The overall improvement index (OII) exceeded 80% for all patients. The symptom score decreased by 0.77±0.13 mmHg, and the sign score decreased by 1.67±0.12 mmHg.

Conclusion: Intense pulsed light therapy is an effective and safe therapy for moderate to severe acute blepharitis/blepharoconjunctivitis.

Introduction

Meibomian gland dysfunction (MGD) describes the functional abnormalities of the meibomian glands which are concerned with the production of tear film lipids, making the glandular secretion abnormality of the meibomian glands. Blepharitis is the general term defines inflammation of the eyelids as a whole. Acute blepharitis is the eyelid infection, may be bacterial, viral, or parasitic in etiology often associated with anterior blepharitis, with the most prominent changes centered on the meibomian glands. Acute blepharitis along with secondary conjunctival and corneal involvement is referred as acute blepharokeraotconjunctivitis. The consequences of meibomian gland dysfunction may be increased bacterial growth on the lid margin and ocular surface inflammation and damage.1

The diagnosis of acute blepharitis/blepharoconjunctivitis required the following features: inflamed eyelids, anterior lid margin erythema, and accumulations of colloid around the lashes. The mean ± SD range was 22±1.5 episodes of chronic red eye, watering, photophobia, blepharitis including stye meibomian cysts, and keratitis. Clinical symptoms and signs were graded as mild, moderate, or severe. Warm compresses, lid massage, daily lid hygiene, topical and/or systemic broad-spectrum antibiotics, topical corticosteroids) may be limited in their efficacy in moderate to advanced acute blepharitis/blepharoconjunctivitis treatment.2

While intense pulsed light (IPL) therapy has been applied in the periorcular area in dermatology for over a decade in the treatment of rosacea, it has been recently applied for the treatment of blepharitis.3-5 While the efficacy of IPL was noted, no treatment has been compared with IPL for the improvement of dry eye symptoms in their dry eye symptoms and the clinical application of IPL devices have been extended to include the treatment of MGD6-9

This study aims to retrospectively evaluate the effect of a series of three bilateral IPL treatments additional to clinical-based treatments in patients with moderate to severe acute blepharitis/blepharoconjunctivitis.

Methods

Individuals received bilateral treatments using an intense pulsed light device (E Eye, Elswin, Paris, France) with moderate to severe acute blepharitis/blepharoconjunctivitis attending Dunya Göz Eye Hospital were enrolled in the study. Patients with excessive sun exposure in 1 month, a history of herpes zoster infection, pregnancy, use of phototoxic drugs/drugs, or skin Fitzpatrick scale V-VI were excluded from the IPL treatment. Information was obtained from all subjects after explaining the treatment and therapeutic benefits of the IPL treatment.

Clinical evaluations performed at baseline and week 10 were slit-lamp examinations and symptom scores (the Compression Of The Eyelid (COTE) grading system, Ocular Surface Disease Index (OSDI), ocular surface staining with Rose Bengal, meibography and meibometry, and Sessions Menisic (LLT), meibography and meibometry, as well as dryness symptom scale, and visual analog scale for burning, stinging, and redness) were analyzed using the Friedman test with the Wilcoxon signed rank test for paired samples. Significant differences were identified when p < 0.05.

Conclusion: Intense pulsed light therapy significantly improved severe to moderate acute blepharitis/blepharoconjunctivitis symptoms and clinical signs, including meibomian gland morphology and secretion quality.

Key words: blepharitis, blepharoconjunctivitis, intense pulsed light treatment, meibography

Discussion

MGD is an extremely important condition that can lead to hyperopermatibility and instability of the tear film, increased bacterial growth on the lid margin, symptoms of eye irritation, ocular surface inflammation, and dry eye. MGD causes modulation of the lipid layer, which is greater than some other factors. Increased severe inflammation and bacterial overgrowth that exacerbates abnormal meibum production. Inflammation of meibomian glands refers to acute blepharitis/blepharoconjunctivitis can be treated with warm compresses and lid massage, topical antibiotics, topical steroids for a short period, and systemic antibiotics in moderately severe or severe cases. Most of acute blepharitis/blepharoconjunctivitis cases bear underlying MGD. The treatment could be take a long time and need persistent care. The occurrences within the follow up period can be seen frequently and require repeat therapies.

Since the efficacy of IPL therapy for patients with dry eye due to MGD was discovered during IPL treatment of facial rhytids over a decade, IPL became a non-invasive therapy for blepharitis symptoms and objective findings and well-tolerated treatment option in patients with mild to moderate MGD or dry eyes.3-10

Underlying mechanisms of the efficacy of IPL treatment is not clearly understood. Possible multiple mechanisms of action may be involved: 1) Decrease inflammation; 2) Inhibition of abnormal epidermal metastatic blood vessels removes a major source of inflammation from the eyelids and meibomian gland.11,12 3) Thermal response to meibomian gland and liquefying the meibum. 4) The photothermal effect decreases the meibum density and increases the rate of meibomian gland dropout. 5) Photomechanical destruction changes at the gland and protein levels by means of γ-irradiation and infrared light.13,14 6) Increased proliferation rate of fibroblasts and enhancing the synthesis of collagen genes.15,16 7) Measurement of Demodex and decrease the microbial load on eyelids 8) Interfering with the positive feedback loop underlying the inflammatory cycle by regulation of anti-inflammatory agents and MMPs.17-20

In this study, we showed the improvement in the subjective symptoms and objective signs of acute blepharitis/blepharoconjunctivitis after a series of IPL treatments combined with short term medical therapy.

We found that IPL therapy was effective for management of moderate to severe acute blepharitis/blepharoconjunctivitis, being associated with improvement in ocular-surface indices (OSDI scores, subjective symptom, meibograph non-contact TMH, and NIBUT) and MG function indices (COTE grading system and LLT), and MG morphological indices as determined with the non-contact meibography system with IOP.C. Ocular Surface Analysis System.

Retrospective and single arm design of the study, small number of patients, lack of the control group, short follow up time are the limitations to our study. Further studies with a larger number of patients with a control group longer follow-up periods will be necessary to confirm the long-term effectiveness and safety of IPL treatment. The limitation is the continuation to the current medications during the study.

Conclusion

In conclusion, our results suggest that serial IPL therapy is effective and safe for patients with moderate to severe acute blepharitis/blepharoconjunctivitis symptoms and clinical signs, including meibomian gland morphology and secretion quality, additional to other conventional therapies.

References