Purpose

- Ocular rosacea and meibomian gland disease is a major contributor to keratoconjunctivitis sicca after chronic graft-versus-host disease (GVHD).
- GVHD exacerbates the mucin deficiency from conjunctival goblet cell death and aqueous deficiency caused by damage to lacrimal and accessory lacrimal glands similar to the cholecystitis damage in the biliary system.
- There is an extreme unmet need in the understanding and treatment of keratoconjunctivitis sicca which develops after chronic ocular GVHD.
- Many chronic GVHD patients recover without significant painful symptoms of irritation, chronic foreign body sensation and light sensitivity.
- However, a minority of patients are permanently disabled from their symptoms. Their cancer is gone, but their quality of life is significantly altered.
- Traditional treatments are not sufficient for these severely affected patients and include:
  - Preservative free artificial tears
  - Moisture chambers
  - Punctal plugging and cautery
  - Topical cyclosporine drops
  - Oral tetracycline derivatives
  - Autologous serum tears
  - Ocular contact lens prosthesis
  - Lateral tarsorrhaphy
  - Conjunctival surgery
  - Corneal transplantation
- Lipiflow and intense pulse light (IPL) treatment under a research protocol
- Lipiflow and intense pulse light (IPL)
  - Corneal transplantation
  - Lateral tarsorrhaphy
  - Preservative free artificial tears
- Traditional treatments are not sufficient for:
  - Their cancer is gone, but their quality of life is significantly altered.
  - A minority of patients are permanently disabled from their symptoms.

Methods

- 8 subjects status post bone marrow transplant with inactive GVHD with ocular rosacea, meibomian gland dysfunction, and severe dry eye symptoms were prospectively examined and treated with IPL and lid expression under approved institutional review board (IRB) protocol.
- Subjects’ GVHD was deemed inactive by the treating hematologist.
- All subjects had failed to respond to conventional therapies.
- Subjects were evaluated by a single ophthalmologist with SPEED2 and OSDI analysis, tear osmolarity, tear meniscus staining, Schirmers testing, lipid tear film lissamine green and fluorescein vital dye analysis, tear film breakup time at baseline, 1, 2, and 3 months post treatment.
- Subjects received IPL and lid expression at baseline, months 1, 2, and 3.
- All subjects had conjunctival sub epithelial fibroplastic scarring from GVHD.
- 6 out of 7 subjects had superior limbic keratoconjunctivitis.
- Overall, the subjects experienced an 86% improvement in total number meibomian glands yielding liquid secretions on the lower eyelids which almost reached statistical significance in this small pilot study.
- The average SPEED2 score dropped 57.1% (p=0.027) after the pilot study.

Results

- Average subject age: 49 years
- 5 women and 3 men
- 1 male subject developed active GI GVHD and had to drop out of the study at month 3.
- All subjects had conjunctival sub epithelial fibroplastic scarring from GVHD.
- 6 out of 7 subjects had superior limbic keratoconjunctivitis.
- Overall, the subjects experienced an 86% improvement in total number meibomian glands yielding liquid secretions on the lower eyelids which almost reached statistical significance in this small pilot study.
- The average SPEED2 score dropped 57.1% (p=0.027), and the OSDI also dropped 57.1% (p=0.027) after the IPL treatments.
- Most of the subjects with severe meibomian gland loss and 1 subject with atrophic changes on glands from meibomography did not improve with IPL treatment.
- 3 subjects that had significant symptom improvement had mild, severe and moderate meibomian gland loss.
- No vision loss or ocular side effects were observed during the course of the study.

Conclusions

- Dry eye in GVHD is a multifactorial ocular surface disease affecting all contributors to tear film composition. A multifactorial approach for treating this severe form of dry eye is needed to improve quality of life for these bone marrow transplant patients. This pilot study shows symptomatic improvement of dry eye symptoms after IPL treatment in patients with GVHD after BMT. This pilot study is limited by small sample size, lack of case control, and single observer bias.
- The symptom improvement may be confounded with use of punctal occlusion for severe filamentary keratitis during the course of the study. However, the meibomian gland evaluation improved over the treatment course, which would not be expected with punctal occlusion. Severe abnormalities on meibography is a negative prognostic indicator for symptom improvement. Long-term follow-up is planned to evaluate the duration of symptom and gland improvements.

References


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