COPING WITH DRY EYES AND PHOTOphOBIA

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Disclaimer

I have no financial interests to disclose and will not be discussing off label use.

This talk is for information purposes and is not medical advice, please talk to your eye doctor about your particular treatment plan.
01  Dry Eye Basics  
Learning the terminology of dry eye

02  Dry Eye and Blepharospasm  
How dry and blepharospasm interact

03  Treatment  
What we can do about it
OUTLINE

- Basics of Dry Eye and Blepharitis
- How Ocular Surface Disease Exacerbates Blepharospasm
- Treatment Options for Dry Eye
- How to Manage Temporary Lagophthalmos after Botox
- Treating Photophobia
01 Basics of Dry Eye
“Dry eye is a **multifactorial** disease of the ocular surface characterized by a **loss of homeostasis** of the tear film, and accompanied by **ocular symptoms**, in which tear film instability and hyperosmolarity, ocular surface inflammation and damage, and neurosensory abnormalities play etiological roles.”

**TFOS DEWS II Report**
“Dry eye can be caused by many factors which disrupt the normal balance of the tear film resulting in ocular discomfort.”
Spectrum of Dry Eye

Aqueous Deficient
Low production of tears

Evaporative
Early evaporation of tears
Spectrum of Dry Eye

Some definitions:
- **TBUT (Tear Break Up Time)** – The amount of time it takes the tears to evaporate between blinks. Normal is greater than 10 seconds.
- **Tear Osmolarity** – A measure of how concentrated the tears are. Higher numbers mean there is less water in the tears.
- **Tear Film** – The layer of tears which covers the eye surface. There is an oil layer and a combined water and mucous layer, both are important.
Tear Hyperosmolarity (Highly concentrated tears)

Aqueous Deficiency (Low tear production)

Autoimmune disease, refractive surgery, reflex block, some medications

Evaporative (Early evaporation)

Low humidity, high wind or temperature, Meibomian gland disease

Inflammatory Cascade

Tear Film Instability

Surface Breakdown

Vicious Cycle
How Do We Diagnose Dry Eye?

Symptoms

Tearing, Burning, Itching
Light Sensitivity
Redness
Intermittent Blur
“Heavy” “Gritty”
How Do We Diagnose Dry Eye?

**Screening**
- **OSDI** (Ocular Surface Disease Index)
  12 questions, from 0 to 4
- **SANDE** (Symptom Assessment in Dry Eye)
  Frequency and severity from 0 to 100
- **SPEED**
  8 items within frequency/severity, total score 0 to 28
How Do We Diagnose Dry Eye?

In the Clinic

Dye Staining
Schirmer Testing
MMP-9 Testing
Tear Osmolarity
How Do We Diagnose Dry Eye?

Diagnostics

Topography
Epithelial Mapping
Meibomography
02
Dry Eye and Blepharospasm
The Influence of Benign Essential Blepharospasm on Dry Eye Disease and Ocular Inflammation

RONG LU, RUI SHENG HUANG, KANG LI, XIN CHUN ZHANG, HUI YANG, YADAN QUAN, AND QIAN LI

Compared dry eye symptoms in blepharospasm against patients with dry eye disease and patients with neither disease
Dry Eye and Blepharospasm

Blepharospasm
40 patients were recruited with blepharospasm and dry eye disease to analyze cytokines

Dry Eye Disease
40 patients with dry eye disease were recruited to compare their baseline

Healthy controls
40 healthy controls were used to obtain averages for patients without either condition
Dry Eye and Blepharospasm

For all patients, they measured:
- OSDI Questionnaire
- Tear Break Up Time (TBUT)
- Schirmer I test
- Fluorescein Staining
- Impression Cytology
- Cytokine Assay
Dry Eye and Blepharospasm

- Patients with dry eye and blepharospasm had significantly higher inflammatory markers.
- All patients improved with Botox injection.
- After Botox injection, average OSDI scores and tear break up times improved.
- It was felt that the microabrasive effects of blinking in blepharospasm contribute to the feedback of dry eye symptoms.
Tear Hyperosmolarity
(Highly concentrated tears)

Aqueous Deficiency
(Low tear production)

Autoimmune disease, refractive surgery, reflex block, some medications

Evaporative
(Low tear production)

Low humidity, high wind or temperature, Meibomian gland disease

Inflammatory Cascade

Tear Hyperosmolarity
(Highly concentrated tears)

Surface Breakdown

Abnormal blink
In blepharospasm

Vicious Cycle

Tear Film Instability
16 patients with blepharospasm and dry eye

Botox relieved blepharospasm in all patients

3 dry eye improved, 8 no difference, 5 worse

Dry Eye and Blepharospasm

CLINICAL SCIENCE

Botulinum toxin A treatment in patients suffering from blepharospasm and dry eye

J Horwath-Winter, J Bergloeff, I Floegel, E-M Haller-Schober, O Schmut

Br J Ophthalmo 2003;87:54–56
Dry Eye and Blepharospasm

Changes in ocular higher-order aberrations following botulinum toxin treatment in patients with blepharospasm

BTX improves dry eye in patients with BEB

Yoshihiko Ishiki¹² · Hiroto Ishikawa¹ · Osamu Mimura¹

- Better Schirmer and TBUT after Botox
- Higher order aberrations, an objective measurement of visual blur, improved also
Dry Eye Treatment
How Do We Treat Dry Eye?

**Initial Treatment**
- Artificial Tears
- Warm Compresses
- Eyelid Scrubs
- Artificial Tear Ointment
- Environmental Modification
How Do We Treat Dry Eye?

**Moderate Dry Eye Treatment**
- Preservative free artificial tears
- Anti-inflammatories (Restasis, Xiidra, Cequa)
- Topical steroid pulse
- Punctal plugs
- Omega-3 supplementation
- Doxycycline/Azithromycin
How Do We Treat Dry Eye?

Severe Dry Eye Treatment
- Eyelid Thermal Pulsation (Lipiflow, etc)
- Punctal cautery
- Autologous Serum Tears
- Amniotic Membrane
- Scleral/PROSE lenses
- Targeted surgical treatments
How Do We Treat Dry Eye?

Eyelid Scrubs

OcuSoft Plus

Avenova

SteriLid
04 Treating Lagophthalmos After Botox
Treating Lagophthalmos After Botox
Treating Lagophthalmos After Botox

- Preservative free artificial tears
- Topical ophthalmic ointments
- Tape Tarsorrhaphy
- Moisture chamber
- Glue or Suture Tarsorrhaphy
Treating Lagophthalmos After Botox

Source: Eyeeco.com
05 Treatments for Photophobia
Treating Photophobia In Blepharospasm

Effect of light on blinking in patients with idiopathic isolated blepharospasm

Yiwen Wu\textsuperscript{a,b,c,**}, Hyun Joo Cho\textsuperscript{c}, Pattamon Panyakaew\textsuperscript{c,d}, Charulata Sankhla Savant\textsuperscript{c,e}, Tianxia Wu\textsuperscript{f}, Nguyet Dang\textsuperscript{c}, Mark Hallett\textsuperscript{c,**}

- Blocking 480 and 590nm wavelengths helpful
- FL-41 tint shown to help in these cases
Treating Photophobia In Blepharospasm

FL-41 Tint Improves Blink Frequency, Light Sensitivity, and Functional Limitations in Patients with Benign Essential Blepharospasm

Marcus K. Blackburn, MD, Randy D. Lamb, MD, Kathleen B. Digre, MD, A. Gordon Smith, MD, Judith E.A. Warner, MD, Robert W McClane, MS, Sanjeev D. Nandedkar, PhD, Wendy J. Langeberg, MPH, Richard Holubkov, PhD, and Bradley J. Katz, MD, PhD

- FL-41 tint showed significant benefit over standard gray or rose-tinted lenses
- Less fluorescent sensitivity, tearing, blinking
Summary

- There is overlap between dry eye disease and blepharospasm, with evidence of two-way exacerbation of either disease
- Botox significantly improves blepharospasm and can improve signs of dry eye
- Combined treatment can improve quality of life and restore function
Sources


Sources

THANKS!

Any questions?

Wills Eye Physicians
Paoli, PA
Philadelphia, PA

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