THE RED EYE

ANNIE MOREAU, MD FACS
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OKLAHOMA ACP SCIENTIFIC MEETING
WHO AM I?

ANNIE MOREAU, MD

▸ French-Canadian
▸ Med School @ OU
▸ Residency in Ophthalmology @ DMEI
▸ Fellowship in Ophthalmic Plastic & Reconstructive Surgery @ DMEI
▸ Full-time Associate Professor with OU Department of Ophthalmology
DISCLOSURE STATEMENT

NO FINANCIAL OR NONFINANCIAL DISCLOSURES
NO CONFLICTS OF INTEREST
LEARNING OBJECTIVES

Identify the most common types of ocular inflammation

Recognize the signs & symptoms related to ocular inflammation

Understand the different treatment and management approach & the need for tertiary care referrals.
FACTS

THANK YOU

- Thank you for helping us take care of patients, whether in or outpatient setting.
- Thank you Dr Jeffries for the invitation to present.
- Ophthalmologists are not really “real” doctors.

Anyone knows what this is?
WHO IS AT DEAN MCGEE?

SUBSPECIALTIES

- Cornea & External Disease
- Cataract & Refractive Surgery
- Glaucoma
- Intraocular Inflammatory Diseases
- Vitreoretinal Diseases (Medical & Surgical)
- Pediatric & Strabismus
- Neuro-Ophthalmology
- Ophthalmic Pathology / Ocular Oncology
- Low Vision Rehabilitation
- Oculoplastic/Orbit
RED EYE IS THE CARDINAL SIGN OF OCULAR INFLAMMATION

RED EYES ARE SEEN ACROSS THE ROOM AND READILY NOTICED!

THIS ALLOWS US TO HAVE VERY EARLY DETECTION OF EITHER A FOCAL, BENIGN, SELF-LIMITED CONDITION OR IT CAN BE THE FIRST SIGN OF A MORE SERIOUS SYSTEMIC DISEASE FOR WHICH WE NEED THE EXPERTISE OF OTHERS......LIKE YOU!
THE INFLAMED RED EYE

ETIOLOGY

- Blepharitis
- Keratitis
- Conjunctivitis
- Episcleritis
- Scleritis
- Uveitis / Iritis
- Endophthalmitis

Watch out contact lens wearers
THE INFLAMED RED EYE

▸ Blepharitis
▸ Keratitis
▸ Conjunctivitis
▸ Episcleritis
▸ Scleritis
▸ Uveitis / Iritis
▸ Endophthalmitis

Which one is the most common?
THE INFLAMED RED EYE

▸ Blepharitis
▸ Keratitis
▸ Conjunctivitis
▸ Episcleritis
▸ Scleritis
▸ Uveitis / Iritis
▸ Endophthalmitis

Which one is the least common?

This is also the one with the highest potential for blindness
THE INFLAMED RED EYE

▸ Blepharitis
▸ Keratitis
▸ Conjunctivitis
▸ Episcleritis
▸ Scleritis
▸ Uveitis / Iritis
▸ Endophthalmitis

Which one is the most likely related to a systemic condition?
THE INFLAMED RED EYE

THE FOCUS OF THIS TALK

- Blepharitis
- Keratitis
- Conjunctivitis
- Episcleritis
- Scleritis
- Uveitis / Iritis
- Endophthalmitis
ANATOMY

WHAT’S WHAT?
ANATOMY

CONJUNCTIVA VS EPISCLERA VS SCLERA

[Diagram showing the anatomy of the eye with labels for Conjunctiva, Anterior Tenon's capsule, Episclera, Sclera, Greater arterial circle of iris (incomplete), Lesser arterial circle (incomplete), and Three layers fused at limbus.]
ANATOMY

VASCULATURE

Conjunctiva
Conjunctival plexus
Episclera
Superficial episcleral plexus
Tenon’s capsule
Anterior ciliary artery

Deep vascular plexus
Sclera
The conjunctiva is what prevents contact lenses from going behind the eye!!
THE RED EYE

CONJUNCTIVITIS

- Inflammation of the conjunctiva
- Most common reason for missed school or work days!
- Symptoms are redness, discharge, crusting, blurry vision, photophobia, irritation
- Most commonly sequentially bilateral
- Self-limited (resolves w/i 10 days w/o tx)
CONJUNCTIVITIS

- Bacterial
  - purulent discharge
  - eyes “glued” shut in the morning
  - more frequent in children
CONJUNCTIVITIS

- Bacterial
  - purulent discharge
  - eyes “glued” shut in the morning
  - more frequent in children
- Viral
  - mucoserous discharge
  - pre-auricular lymphadenopathy
THE RED EYE

CONJUNCTIVITIS

- Bacterial
  - purulent discharge
  - eyes “glued” shut in the morning
  - more frequent in children
- Viral
  - mucoserous discharge
  - pre-auricular lymphadenopathy
- Allergic
  - watery discharge with chemosis & pruritus
CONJUNCTIVITIS

Which one is the most common?

- **Bacterial**
  - purulent discharge
  - eyes “glued” shut in the morning
  - more frequent in children
- **Viral**
  - mucoserosus discharge
  - pre-auricular lymphadenopathy
- **Allergic**
  - watery discharge with chemosis & pruritus
Conjunctivitis is a clinical diagnosis

- Ask the right questions
  - Anyone around with a red eye?
  - Do you wear contact lenses?
  - New pet / new make up?
- Partner with same thing?
- Cultures can be helpful
- Expect Staph & Strep
CONJUNCTIVITIS

TREATMENT

- **Proper hygiene & hand washing**
  (Frequent change of pillow cases / Throw away makeup / Stop wearing contact lenses)

- **Bacterial**: Antibacterial ophthalmic meds

- **Viral**: Cool compress + Artificial tears

- **Allergic**: Remove the offender! Antihistamine & Mast-Cell Stabilizer
WHEN DO YOU NEED SYSTEMIC ANTIBIOTICS?

- Chlamydia
  - Macrolides (azithromycin)
  - Tetracyclines
- Neisseria gonorrhea
  - Ceftriaxone inj. + Azithromycin
  - Inform sexual contacts
CONJUNCTIVITIS

WHEN DO YOU REFER?

▸ Newborn & Infants
▸ “Conjunctivitis” for more than 2 weeks
▸ Severe pain or photophobia
▸ Visual acuity is significantly reduced
▸ Recent eye surgery or ocular trauma
▸ Contact Lens wearers, especially the non-compliant ones!
CONJUNCTIVITIS

FORGET ALL THE PREVIOUS SLIDES. JUST REMEMBER THIS ONE

Avoid Steroids
CONJUNCTIVITIS

FORGET ALL THE PREVIOUS SLIDES. JUST REMEMBER THIS ONE

Avoid Steroids
THE RED EYE

EPISCLERITIS
EPISCLERITIS

PRESENTATION

- Benign, self-limited inflammation of the episcleral tissues
- Simple (most common) or Nodular
- Sectoral (most common) or Diffuse
- Unilateral
- Idiopathic
- Pathophysiology unknown
- Resolves within 7-10 days
EPISCLERITIS

SIGNS & SYMPTOMS

▸ Pain (but not severe, sometimes none!)

▸ Redness, photophobia

▸ Don’t expect a discharge like in conjunctivitis

Nodular

Simple

Sectoral
**THE COOL TRICK!**

- Phenylephrine is a direct-acting sympathomimetic
- Alpha-1 adrenergic agonist
- Contracts the dilator pupillae
- Constrict the conjunctival & episcleral arteriolar system
EPISCLERITIS

TREATMENT

▸ Reassurance

▸ Go back to work!!

▸ Supportive measures
  ▸ Cool compresses
  ▸ Artificial Tears

▸ Oral NSAIDs
  ▸ Ibuprofen 600mg TID
  ▸ Indomethacin 75mg BID

AVOID STEROIDS
WHEN DO YOU REFER?

- “Episcleritis” for more than 2 weeks
- Severe pain or photophobia
- Visual acuity is significantly reduced
- Recent eye surgery or ocular trauma
- Contact lens wearers
THE RED EYE

SCLERITIS

- Severe, destructive, vision-threatening inflammation of the sclera
- Marked piercing pain which can awaken patient from sleep or radiate to the face, jaw, ear.
- 4th - 6th decade of life
- More female (1.6:1)
- Asymmetrically bilateral
- Insidious onset
SCLERITIS

PATHOPHYSIOLOGY

- Type III Hypersensitivity reaction
- Granulomatous (epithelioid or multinucleated giant cells) vs Nongranulomatous (lymphocytes, plasma cells, macrophages)
- 50% a/w systemic condition
  - Most common: RA
  - No HLA association

<table>
<thead>
<tr>
<th>Causes of scleritis</th>
<th>Infectious diseases</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rheumatoid arthritis ★</td>
<td>Syphilis</td>
<td>Ocular surgery</td>
</tr>
<tr>
<td>Wegener’s granulomatosis ★</td>
<td>Sarcoidosis</td>
<td>Metabolic causes</td>
</tr>
<tr>
<td>Polyarteritis nodosa</td>
<td>Herpes zoster</td>
<td>Trauma</td>
</tr>
<tr>
<td>Relapsing polychondritis</td>
<td>Herpes simplex</td>
<td></td>
</tr>
<tr>
<td>Psoriatic arthritis</td>
<td>Tuberculosis</td>
<td></td>
</tr>
<tr>
<td>Reiter’s syndrome</td>
<td>Lyme disease</td>
<td></td>
</tr>
<tr>
<td>Ankylosing spondylitis</td>
<td>Bacterial</td>
<td></td>
</tr>
<tr>
<td>Systemic lupus erythematos ★</td>
<td>Fungal</td>
<td></td>
</tr>
<tr>
<td>IgA nephropathy</td>
<td>HIV</td>
<td></td>
</tr>
<tr>
<td>Giant cell arteritis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behcet’s disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Takayasu’s arteritis</td>
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<tr>
<td>Crohn’s disease</td>
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<tr>
<td>Ulcerative colitis</td>
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<td></td>
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<tr>
<td>Gout</td>
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</tbody>
</table>
WHAT DO WE TELL OUR PATIENTS

▸ Relapsing polychondritis patient has a 14% chance of developing scleritis
▸ Wegener’s granulomatosis patient has a 10% chance
▸ IBS has a 10% chance
▸ RA has a 6% chance
BISPHOSPHONATES SIDE EFFECT

First-time users of Bisphosphonates is a/w increased risk for scleritis

Unclear mechanism but possibly release of inflammatory mediators

NNH: 370

Discontinuation of the drug is recommended

Mahyar Etminan PharmD MSc, Farzin Forooaghan MD MSc, David Maberley MD MSc. Inflammatory ocular adverse events with the use of oral bisphosphonates: a retrospective cohort study. CMAJ May 15, 2012 184 (8)
SCLERITIS

EXAM

- Violet-bluish hue or salmon color
- Inflamed scleral vessels have a criss-crossed pattern
- It will not blanch with phenylephrine
- The entire globe is tender
- Pain is worse with eye movements
SCLERITIS

ANTERIOR VS POSTERIOR

▶ Anterior
  ▶ Diffuse: most common & most treatable
  ▶ Nodular
  ▶ Necrotizing: most severe
▶ Posterior
SCLERITIS

WORKUP

- Scleritis is a clinical diagnosis
- Ultrasound or CT to rule out posterior scleritis
- First episode does not warrant lab workup, but we base it on our index of suspicion.
- Look for connective tissue disorder or autoimmune condition
- Scleral biopsy might be warranted

<table>
<thead>
<tr>
<th>Test</th>
<th>Scleritis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest x-ray or CT scan</td>
<td>Sarcoidosis (CT more sensitive than chest x-ray)</td>
</tr>
</tbody>
</table>

Posterior Scleritis
SCLERITIS

TREATMENT

▸ NSAIDs trial (Indomethacin has been most effective)
  ▸ Continue until inflammation completely subsided
  ▸ Prednisone, 1 mg/kG/day (daily max 80mg) w/ slow taper for 6 wks
  ▸ If no or minimal response in 6 wks, add immunosuppressive agents

▸ Immunosuppressive drugs
  ▸ Rituximab, Cyclophosphamide, Methotrexate, Cyclosporine, Mycophenolate
  ▸ We do not have Randomized Controlled Trial for scleritis & no well-defined optimal treatment length

TREATMENT

- 67% of patients require high-dose glucocorticoids or a combination of steroids & another immunosuppressive agent

- Surgical intervention may be required for vision or globe preservation

## EPISCLERITIS VS SCLERITIS

<table>
<thead>
<tr>
<th>Pathophysiology</th>
<th>Episcleritis</th>
<th>Scleritis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idiopathic inflammation</td>
<td>Autoimmune dysregulation</td>
<td></td>
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</tbody>
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### Symptoms

<table>
<thead>
<tr>
<th></th>
<th>Episcleritis</th>
<th>Scleritis</th>
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</thead>
<tbody>
<tr>
<td>Acute onset</td>
<td></td>
<td>Subacute onset</td>
</tr>
<tr>
<td>Mild pain</td>
<td></td>
<td>Severe pain</td>
</tr>
<tr>
<td>Redness, irritation</td>
<td></td>
<td>Pain with eye movement</td>
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<tr>
<td></td>
<td></td>
<td>Blurred vision/vision loss</td>
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<td></td>
<td></td>
<td>Photophobia</td>
</tr>
</tbody>
</table>

### Physical Exam

<table>
<thead>
<tr>
<th></th>
<th>Episcleritis</th>
<th>Scleritis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile vessels</td>
<td></td>
<td>Adherent vessels</td>
</tr>
<tr>
<td>Blanch with phenylephrine drops</td>
<td></td>
<td>Does NOT blanch with phenylephrine drops</td>
</tr>
<tr>
<td>Reddish hue</td>
<td></td>
<td>Bluish hue</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Slit lamp may reveal nodules, scleral thinning, and corneal changes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Systemic inflammation (joint pain, rashes, etc)</td>
</tr>
</tbody>
</table>

### Treatment

<table>
<thead>
<tr>
<th></th>
<th>Episcleritis</th>
<th>Scleritis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-limited</td>
<td></td>
<td>Ophthalmology consult</td>
</tr>
<tr>
<td>Consider topical steroids in refractory cases</td>
<td></td>
<td>Systemic steroids/NSAIDs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+/- Topical antibiotics</td>
</tr>
</tbody>
</table>
Conjunctivitis, Episcleritis & Scleritis are clinical diagnosis.

We cannot solely rely on labs or imaging to differentiate them all.

It’s still sometimes a fine line between all of them. So never hesitate to reach out to us.
MOST IMPORTANT SLIDE…..

Call/Text anytime for any patients (yourself included!!) with anything related to eyeballs. I am always happy to help.

my cell: 405-760-7685
Thank you!