USE AND ABUSE OF STEROIDS

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RULE #1

- UNDERSTAND THAT ALL TREATMENTS HAVE SOME RISK
- KNOW RISK VS BENEFIT OF THERAPY
- ALWAYS EVALUATE PATIENTS FOR SIDE-EFFECTS AND ADVERSE EFFECTS OF THERAPY
RULE # 2

• YOU MUST HAVE A DIAGNOSIS BEFORE YOU TREAT

• TREATMENT IS EASY DIAGNOSIS IS TOUGH
RULE #3

- TREAT MECHANISMS, NOT NAMES.
- RECOGNIZE PRESENCE OF INFLAMMATION, INFECTION, TRAUMA. THEY CAN EXIST INDIVIDUALLY OR TOGETHER.
INFLAMMATION - THE
GOOD

- The Good
  Destroy invading pathogens
  Remove dead tissue
  Replace damaged tissue with scar tissue-fibrosis
INFLAMMATION - THE BAD

• The Bad

Primary inflammation or inflammation secondary to trauma, infection or autoimmune disorders must be controlled to minimize damage and loss of function ie corneal scarring

• Always TX underlying cause of inflammation.
STEROID PHARMACOLOGY

- **Mechanism of action**: Inhibit formation of leukotrienes and prostaglandins-inflammatoty mediators
- Inhibit WBC migration
- Inhibit fibroblasts
THE INFLAMMATORY CASCADE

Cellular phospholipid membrane

ARACHIDONIC ACID

CYCLOOXYGENASE

PROSTAGLANDINS

LIPOXYGENASE

LEUKOTRIENES
STERROID INDICATIONS
ANTERIOR SEGMENT
Ocular Allergy

- Acute Type I Anaphylaxis
- VKC
- AKC
- GPC
- Good for stabilization, then consider maintenance therapy
Ocular Allergy-Seasonal
Lots of Itch, No tissue damage-
Initially@@@, A Pure Histamine Act
If There are Eosinophils, It Ain’t Simple Allergic Conjunctivitis

- Eosinophils - Nasty little WBC’s full of “ACID” (Major basic protein)
- Attracted by release of PAF (platelet activating factor) and ECF (Eosinophilic chemotactic factor)
- Produce permanent tissue changes seen in VKC and GPC
POST-OP USE

- Refractive surgery
- Cataract surgery, extended use can dramatically reduce the incidence of post-op CME
- Reduce inflammation and pain
- Reduce regression and hazing—primarily for PRK
OCULAR INFECTION

- VIRAL

**EKC-** Subepithelial infiltrates and pseudomembranes - minimize loss of accessory lacrimal apparatus

**Herpes simplex** - Minimize corneal scarring in disciform/stromal disease
BACTERIAL

- Staph can produce secondary corneal inflammatory disease
- Marginal ulcers/phlectenular disease
- Useful in bacterial corneal ulcer management?
For Chronic Lid Disease it Beats Steroids Every Time

It blocks a complex organic inflammatory molecule:

OH-POO=POO
A NEW USE FOR DOXYCYCLINE?

Doxycycline inhibition of interleukin-1 in the corneal epithelium.


Ocular Surface and Tear Center, Bascom Palmer Eye Institute, Department of Ophthalmology, University of Miami School of Medicine, Florida 33136, USA.

PURPOSE: To evaluate the effect of doxycycline on the regulation of interleukin (IL)-1 expression and activity in human cultured corneal epithelium. MP.
RESULTS: Doxycycline significantly decreased IL-1beta bioactivity in the supernatants from LPS-treated corneal epithelial cultures. These effects were comparable to those induced by the corticosteroid,

CONCLUSIONS: Doxycycline can suppress the steady state amounts of mRNA and protein of IL-beta and decrease the bioactivity of this major inflammatory cytokine. These data may partially explain the clinically observed anti-inflammatory properties of doxycycline. The observation that doxycycline was equally potent as a corticosteroid, combined with the relative absence of adverse effects, makes it a potent drug for a wide spectrum of ocular surface inflammatory diseases.
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DOXYCYCLINE

- Long acting/potent tetracycline
- Resistant to absorption problems
- Medium GI upset
- Good compliance (1-2 X/D dosing)
- No activity in acute bacterial eye disease
- Inexpensive
- Contraindicated in kids and pregnant patients
Doxycycline

Indications/Dosage forms

• Indications:
  • Back-up drug for Chlamydia
  • Acne rosaceae/chronic Staph blepharitis
  • Corneal erosion

• Dosage forms:
  • 50 and 100mg tablets/capsules
  • 25mg/5ml suspension
Steroids and Dry Eye

- Recognized Inflammatory component to dry eye
- Risk VS Benefit
- “Jump start” Restasis TX
Topical nonpreserved methylprednisolone therapy for keratoconjunctivitis sicca in Sjogren syndrome.

Marsh P, Pflugfelder SC.

Ocular Surface and Tear Center, Bascom Palmer Eye Institute, Department of Ophthalmology, University of Miami School of Medicine, Florida 33136, USA.

CONCLUSIONS: These findings indicate that topical nonpreserved methylprednisolone is an effective treatment option for patients suffering from severe keratoconjunctivitis sicca who continue to experience bothersome eye irritation despite maximum aqueous enhancement therapies. They also suggest that inflammation is a key pathogenic factor in this condition.
CONCLUSIONS: Topical nonpreserved steroid therapy for two weeks before punctal occlusion is effective in controlling symptoms and corneal fluorescein staining in patients with severe keratoconjunctivitis sicca associated with Sjogren's syndrome.
A Clinical Moment

- 28 YO WT male with C/O red, painful OD X 1 month-first occurrence
- TX by primary care doctor with gentamycin drops QID
- Told to use till gone
- Told he has “pink eye”
HISTORY (Cont’d)

- BVA CF’s at 3 feet OD/20/20 OS
- A/C Deep with +3 cell and flare OD
- Post-synechiae 270 degrees OD
- IOP OD 2mm hg/ 17mm Hg OS
- (+) Hx lower back pain
UVEITIS -
Know your Adjectives

• NON-GRANULOMATOUS VS GRANULOMATOUS
• IDIOPATHIC VS SECONDARY VS TRAUMATIC
• ANTERIOR VS INTERMED VS POSTERIOR
• ACUTE VS CHRONIC VS RECURRENT
• UNILATERAL VS BILATERAL
ANATOMICAL CLASSIFICATION

• ANTERIOR
• INTERMEDIATE
• POSTERIOR
• IRIS-ANTERIOR IRITIS/TRABECULITIS

• CILIARY BODY-INTERMEDIATE CYCLITIS/PARS PLANITIS

• CHOROID-POSTERIOR CHORIORETINITIS/VITRITIS FOCAL/DIFFUSE/VASCULITIS

• PANUVEITIS-ENDOPHTHAMITIS
UVEITIS WORK-UP

- PROPER PATIENT EVALUATION - THOROUGH HX AND APPROPRIATE LAB TESTS
- 80% OF FIRST TIME NON-GRANULOMATOUS ANTERIOR UVEITIS IS IDIOPATHIC
GRANULOMATOUS VS NONGRANULOMATOUS
NONGRANULOMATOUS UVEITIS

IT:

- Comes on FAST
- HURTS
- Produces a RED EYE
- Fine KP / Sterile hypopion
- Recurrent
- HX of ACHING type systemic diseases
- 80% are idiopathic
- Commonly associated with
  SPONDYLARTHROPATHIES
GRANULOMATOUS UVEITIS

- Insidious / Chronic- "smoldering"
- Predominance of cells- "Mutton-fat" KP
- Most commonly associated with underlying systemic disorders: TB, Syphilus, Sarcoid, Toxoplasmosis, etc
- A medical consult is MANDATORY
TEMPORAL Acute Disease

- SUDDEN ONSET
- LASTS LESS THAN 6 WEEKS
- SEVERE SIGNS AND SYMPTOMS
- INTENSE PHOTOPHOBIA
- PRONOUNCED LIMBAL FLUSH
- PRONOUNCED CELL AND FLARE
CHRONIC UVEITIS

- **INSIDIOUS**
- > 6 WEEKS
- **SUBTLE SIGNS AND SYMPTOMS**
- NO PHOTOPHOBIA
- **WHITE EYE**
- LOTS OF CELLS
- LITTLE OR NO FLARE
ETIOLOGICAL CLASSIFICATION

- INFECTIOUS BACTERIA/VIRUS
- NON-INFECTIOUS EXOGENOUS
- NON-INFECTIOUS ENDOGENOUS
- IDIOPATHIC
INFECTIOUS

- BACTERIAL-HYPOPIION COMMON

- VIRAL- H. SIMPLEX AND ZOSTER
NON-INFECTIONOUS

• EXOGENOUS-INJURY

• ENDOGENOUS
  COLLAGEN VASCULAR
  DISEASE
  SPONDYLYLARTHROPATHIES
IDIOPATHIC

- Cause is unknown
- Most common form of acute anterior uveitis
- Common during high allergy and times of stress
DOES IOP GO UP OR DOWN??

THE ANSWER IS........

YES
ANTERIOR UVEITIS AND IOP

IT ALL DEPENDS ON WHATS INFLAMED..........

- Cyclitis: DOWN
- Trabeculitis: UP
- Iritis: Either or neither or BOTH?????
IOP CHANGE MECHANISMS IN IRRITIS

• Blockage of TM by inflammatory GOOP
• Blockage of TM by glycoprotein GOOP
• Posterior synichiae
• Anterior synichiae
COMPLICATIONS OF UVEITIS

- CORNEAL ENDOTHELIAL DAMAGE
- SYNECHIAE
- IRIS NODULES/ATROPHY
- CATARACT
- GLAUCOMA
- MACULAR EDEMA
- RETINAL DETACHMENT
- REDUCED ACUITY
GOALS OF THERAPY

• REDUCE PAIN
• REDUCE PHOTOPHOBIA
• REDUCE INFLAMMATION
• PREVENT COMPLICATIONS
• BREAK AND/OR PREVENT SYNECHiae
DRUG THERAPY

- CORTICOSTEROIDS-Oral vs Topical
- NSAIDS
- CYCLOPLEGICS/MYDRIATICS
- In secondary must TX underlying cause
- Multiple drop dosing increases tissue levels, efficacy and reduces TX failure
SYMPTOMS OF SYSTEMIC DISEASE

DO YOU HAVE??

- BACK PAIN-ANK. SPOND
- WRIST AND ANKLE PAIN-REITERS SYNDROME
- PAIN WHEN URINATING-SYPHILIS/OCCASSIONALLY REITERS
- KNEE PAIN-JRA
SYMPTOMS OF SYSTEMIC DISEASE

- DIARRHEA/CRAMPING-CROHN’S DISEASE
- COUGHING-TB AND SARCOID
- RASHES
- BULLS EYE-LYME DISEASE
- PALMS OR SOLES-SYPHILIS
- VESICULAR-HERPES
- FEVER
- WEIGHT LOSS
- MALAISE
- LYMPHADENOPATHY
The most significant short term adverse effect of TOPICAL steroids is steroid glaucoma.

Avoid topical steroids in H. simplex EPITHELIAL disease.
STEROID PRODUCTS
TOPICAL

- Hms medrysone-low efficacy
- Fluoromethalone-acetate vs alcohol-FML, Eflone, Flairex
- Prednisolone-acetate vs phosphate-Pred forte, Econopred
- Dexamethasone
- Steroid/antibiotic combinations
  Vasocidin, FML-S, Tobradex
TOPICAL STEROIDS-THE NEXT GENERATION
Rimexolone/Vexol/Alcon

• Hybrid molecule-SAR-Structural Activity Relationships
• Best of Fluoromethalone-Reduced Steroid IOP response
• Best of Dexamethasone-Efficacy
• Problem-Efficacy??
Loteprednol/ B & L

Alrex .2%

Lotemax .5%

• New “Soft” molecule technology
• High receptor affinity and rapid metabolism
• High efficacy
• “Reduced” steroid response
• No steroid cataract

ONLY ALREX is FDA approved for seasonal allergy
Topical steroids and Glaucoma

• Dexamethasone-HIGHEST GLC potential

• Low potential
  Rimexolone
  Lotoprednol
  Fluoromethalonalone
AUTOIMMUNE DISEASE

- Episcleritis
- Scleritis - Underlying systemic disease is common - generally avoid topical steroids
- 4 types of scleritis
  - Anterior diffuse
  - Anterior nodular
  - Necrotizing anterior - 97% syst. Dis (Avoid topical steroids - scleral melting)
  - Posterior
NSAIDS OF COURSE THEY’RE SAFER?

- Only anti-inflammatory in high doses
- Think RK good for -11.00 myope or LASIK
- GI ulceration
- Renal failure
- Congestive heart failure
- All diabetics/No No No
- POOR anti-inflammatory effect
Steroids Are Safer?
You must be kidding

- Extremely effective anti-inflammatory effect
- Safe for short term use if.............
- No GI ulcer
- No psychotic
- No high BP
- No diabetes
The 3 TOP REASONS FOR STEROIDS IN EYE DISEASE ARE:

1. TEMPORAL ARTERITIS
2. CRANIAL ARTERITIS
3. ARTERITIC ISCHEMIC OPTIC NEUROPATHY

No, you probably won’t Tx it here, but you’d better not miss it
80-100mg prednisone daily
Temporal Pain?

- Elderly individuals can present with a wide range of acute sx:
  - Visual disturbance/VF loss
  - Diplopia
  - Ptosis
  - Non-specific eye/head pain
- MY MOST COMMON NEGATIVE TESTS
  - ESR / CRP / CBC
The Stats

- Symptomatic patient
- ESR > 47
- NON-Ultra CRP > 2.45
- 98% chance of TA
- TX
- Follow up with TA biopsy within 2 weeks
Steroid nasal inhalers before oral antihistamines

- Know steroid equivalents
- Medrol dospak
- Prednisone—very flexible dosage
- Methyl prednisolone for IV injection-solu-medrol
- Kenalog for local repository effect
good for chalazia
Medrol Dospak
Methyl prednisolone

- High potency oral corticosteroid
- Good anti-inflammatory activity (glucocorticoid)
- Low mineralocorticoid activity
- Convenient
- Inexpensive
- Safe***
Medrol Dose-pak
Indications/dosage forms

- Indications:
  - Anterior uveitis/scleritis/Type I allergy

- Dosage form:
  - Pre-labeled with descending dosage (automatic daily taper over 6 days of TX)

- Always take with food/avoid in diabetics/GI bleeders/blood thinners/NSAIDS/hypertension/psychosis
STEROID SIDE-EFFECTS

- Inhibit good immune response
- Exacerbate infection
- Sodium and water retention
- GI Ulcers
- Increase BP
- Exacerbate diabetes mellitus
- Steroid cataract and glaucoma
- Psychosis
- Addison’s and Cushing’s disease
OPTIC NEURITIS AND STEROIDS

Optic Neuritis TX Trial

- After one year no advantage to tx
- If initial treatment with oral steroids, increased risk of development of multiple sclerosis