

OCULAR PAIN MANAGEMENT

J. James Thimons, OD, FFAO
 Medical Director, Ophthalmic Consultants of Connecticut
 jimthimons@gmail.com

OCULAR PAIN MANAGEMENT

- OCULAR PAIN
 - NEUROLOGIC vs PSYCHOLOGIC
 - ASSOCIATED WITH TISSUE DAMAGE
 - ACUTE vs CHRONIC
 - REASONS FOR UNDERTREATMENT
 - UNDERESTIMATION
 - INADEQUATE COMPREHENSION
 - HESITATION WITH CONTROLLED SUBSTANCES
 - FEAR OF ADDICTION

Pain is NOT a disease-It is a sign of a disorder that must be diagnosed in conjunction with the management of the pain.

Analgesia VS Inflammation

- Choose the proper agent
- Choose the proper dose
- Dosage for the management of inflammation is higher than that for analgesia
- Side-effects increase with higher dosages

Why do I Have Pain?

- Pain mechanisms are complex
- Peripheral VS Central Pain
- Direct nerve stimulation- Finger in Eye
- Inflammatory pain-Prostaglandins
- Tissue damage-Via infection or trauma

When Do I Need to Consider Pain Management?

- Listen to your patient...IF IT HURTS BE PREPARED TO DO SOMETHING!

Nociception

- Nociceptors: Free nerve endings in all tissues
- Brain: No nociceptors, but are located in the meninges
- Cell body outside the spinal column in the dorsal root ganglion
- Called the spinal-thalamic tract

Chemical stimulation of nociceptors

- Prostaglandins
- Bradykinin
- Potassium
- Serotonin
- Histamine

CLINICAL CONSEQUENCES OF PAIN

- MUSCLE SPASMS
- TACHYCARDIA
- HYPERTENSION
- TACHYPNEA
- ANXIETY
- INSOMNIA
- REDUCED COMPLIANCE

Pain Associated with Corneal Trauma

- Acute Onset
- Rapid Increase in Sx
- Associated Symptoms
- Tearing
- Photophobia
- Chemosis
- Lid edema

Corneal Trauma

- Corneal abrasion management
- Debridement?
- Antibiotic, NSAID, soft bandage CL
- Bandage CL - conventional soft CL vs. silicone hydrogel CL
- Oral analgesic

CYCLOPLEGICS

- INHIBIT CILIARY SPASMS
- BOLSTER BLOOD /AQUEOUS BARRIER
- CYCLOGEL
- HOMATROPINE
- SCOPOLAMINE
- ATROPINE

Patching vs Bandage Lenses

- Donnenfeld, E et al
- 165 patients randomized to BCL vs PP
- Equal clinical outcomes
- Marked difference in Quality of life scores and return to work assessment

The Case of “How Could I ever be Mad at You”

- J. James Thimons, O.D., FAAO
- Chairman, National Cornea & Anterior Segment Society

“How could I ever get mad at you”

- GS a 33 y/o Caucasian female presented with a complaint of discomfort, watering and light sensitivity following blunt trauma.
- PEX:
- VA: 20/20 OD – 20/30- OS
- SLE: 2 mm area of epithelial damage with staining at 12:00
- Occasional A/C cell
- 2+ injection

“How could I be mad at you”

- Treatment:
- BCL
- 4th Generation FQ
- Acular PF
- Symptoms resolved after 1 week of Tx
- Patient dismissed with instructions and AT's

“How could I be mad at you”

- Patient returned to office 10 weeks later with c/o AM pain and return of symptoms
- PEX:
- VA: 20/30
- SLE: As shown
- 2+ injection

Recurrent Erosions Contributing Factors

- Dry eyes
- Blepharitis
- External disease / tear film abnormalities

Recurrent Erosions

- Surgical Management
- Epithelial debridement
- chalazion curette
- 57 Beaver Blade

Recurrent Erosions

- Anterior Basement Membrane Puncture
- 20-gauge needle

Post Surgical Tx Management

- 3rd/ 4th Fluoroquinolone
- Topical NSAID (2 day)
- BCL
- AT's
- Oral Pain mgt.
- Amniotic membrane
- Dry
- Cryogenic

ANALGESICS

- CNS ACTING AGENTS
- NARCOTIC AGENTS
- OXYCODONE (II) PERCOSET, PERCODAN, TYLOX
- HYDROCODONE (III) LORTAB, VICODIN
- CODIENE (II, ELIXER V) T3, T4, EMPIRINPROPOXYPHENE(IV) DARVON, DARVON-N, DARVOCET-N
- PENTAZOCINE(IV) TALWIN, TALACEN
- MEPERIDINE(II) DEMEROL

Narcotic agents

- Directly affect opioid receptor
- Agonist, partial agonist, or mixed
- Bind to opioid receptors in brainstem, cortical areas and spinal cord
- Mimic endorphins, producing a morphine like effect whether natural or synthetic

Narcotic Agents

- Effective for severe acute pain
- Patient response variability due to individual sensitivity of opioid receptors
- No addiction likely with short term use
- Dosage varies with drug used and patient
- Adverse effects is usually the limiting factor in usage

Important notification for patients

- Drowsiness
- Dizziness
- Blurred vision
- Nausea/vomiting/constipation
- Take with food to avoid GI distress
- Avoid EtOH or other CNS agents
- Breathing distress

Contraindications

- Bronchial asthma
- COPD
- Emphysema
- Pregnancy
- Hypersensitivity
- Prior addiction
- Renal/Liver dysfunction
- H/O EtOH use, Concurrent use of CNS agents (Tricyclic antidepressants, Phenothiazines)

Narcotic Agents

- Oxycodone
- Schedule II
- Percoset, Percodan, Tylox
- 4.5-5.0 mg tid with Acetaminophen or ASA

Narcotic Agents

- 10-12 times potent than codeine
- Good retention of potency
- May cause euphoria less side effects reported

Narcotic Agents

- Hydrocodone (Schedule III) (Lortab,
- Vicodin) 2.5-10.0mg tid-qid with acetaminophen

Narcotic Agents

- 6 times more potent than codeine
- Less gastrointestinal problems
- Less sedation
- ?? euphoria

Important Clinical Points

- Narcotic agents actually safer for patients with NSAID contraindications
- Peak effect 1.5-2.0 hours after oral dose - advise patients who have acute severe pain.
- No dosing within 14 days of an MAO inhibitor

Narcotic Agents

- Additive or synergistic effect possible when combined with NSAIDs
- Increased dose of narcotic agent will increase analgesic effect but will also risk increased side effects.

Analgesics & Nonsteroidal Anti-Inflammatory Agents

- Nonsteroidal Anti-Inflammatory Agents - peripheral acting agents, prevent stimulation or discharge of nociceptors, more effective for inflammatory related conditions, may have ceiling effect
- Acetylsalicylic acid (ASA) 325-500 mg q4-6h
- Ibuprofen (Motrin, Advil, Nuprin) 400 mg q4-6h
- Naproxen sodium (Aleve) 450 mg loading dose, then 225 mg q6-8h

Analgesics & Nonsteroidal Anti-Inflammatory Agents

- Central Nervous System Agents - reduce perception of pain, effective for inflammatory or non-inflammatory conditions, typically no ceiling effect
- Non-Narcotic agents
- Acetaminophen 325-500 mg q4-6h
- Tramadol (Ultram) 50 mg q4-6h

An aspirin a day keeps the Doctor away

- Gum PA, et al
- JAMA 2001 Sept12: 286:1187-94
- ASA use and all cause mortality
- 6174 patients/ Cleveland Clinic
- Baseline 37% ASA use
- All cause mortality
- ASA use 4%
- Non ASA 8%

Managing Viral Eye Disease Pain

- HSK
- HZK
- EBV
- EKC

VARICELLA ZOSTAR- KERATITIS

- PRIMARY INFECTION
- CHICKEN POX
- VACCINATION RECOMMENDED BY AMERICAN ACAD of PEDIATRICS
- RECURRENT INFECTION
- OPHTHALMIC INVOLVEMENT 10-25%
- OPHTHALMIC ZOSTAR > OVER AGE 60
- UNDER 40 50% IMMUNOCOMPROMISED

Antivirals

- Acyclovir (*Zovirax*)
 -
- Valacyclovir (*Valtrex*)
 -
- Famciclovir (*Famvir*)

Acyclovir (*Zovirax*)

- Acyclovir:
 - Converted to acyclovir triphosphate
 - Inhibits herpes virus DNA polymerase
 - Some activity against varicella-zoster, cytomegalovirus, Epstein-Barr
 - Dose
 - Zoster: **800mg po 5x/day**
 - Simplex: **400mg po 5x/day**
 - Suppressive: **400mg po bid x 1 yr**
 - How supplied:
 - 400 & 800mg Tablets
 - 200mg Capsules
 - 200mg/5ml Oral Susp.

Valacyclovir (*Valtrex*)

- Prodrug of Acyclovir
- *Inactive* until metabolized
- Dose
 - Zoster: 1g po q8h x 7-21 days
 - Simplex: 500mg po q8h x 7-21 days
 - Suppressive: 500mg po qd x 1 yr
- How Supplied:
 - 500 & 1000mg tabs

Famciclovir (*Famvir*)

- Prodrug of penciclovir
- *Higher bioavailability* vs acyclovir
- *Rapidly absorbed* from BI tract
- *Metabolized* into active form
- Effective against simplex & zoster
- Dose
 - Zoster: 500mg po q8h x 7-21 days
 - Simplex: 500mg po q12h x 7-21 days
 - Suppression: 250mg qd x 1 yr
- How Supplied:
 - 125, 250 & 500 Tabs

Antiviral: *the differences*

- Dosing
 - Acyclovir: 5 times/day
 - Valacyclovir: 3 times/day
 - Famvir: 2 times/day
- Cost
 - Acyclovir: \$26.00
 - Valacyclovir: \$125.00
 - Famciclovir: \$147.00

Steroids

- Medrol Dose Pack
- Individualized Regimen
- IV Methyl Pred

HZK

- STROMAL KERATITIS
- BASIC FEATURES
- IMMUNOGENIC RESPONSE
- CLINICAL FEATURES
- DISCIFORM
- SUPPERATIVE
- MIXED
- TREATMENT

Cross Linking: New Technology for and Old Disease

KCN Diagnosis

- Corneal Hydrops
- Munson's sign
- Apical Scarring
- Vogt's Striae
- Irregular Mires
- Abn(anterior)Topo
- High Coma
- Epithelial thickness abnormalities
- Posterior Corneal Curvature
- Relative pachymetry

Floppy Eyelid Syndrome CXL and PRK

- Requires wavefront scan at level 4 reliability
- Predictability is less than standard PRK
- Contraindicated with apical scar
- Post-op similar to standard PRK
- CL's same algorithm

Radial Keratotomy CXL Technique

- Riboflavin drops every 2 min x 30 min
- Pachymetry checked > 400 um
- Check UV light source calibration
- UV light source applied focused onto the cornea
- Riboflavin drops instilled every 2 min while UV light application for 5/30 min
- 1 drop of fluoroquinolone and steroid
- Homatropine 5% x2
- NSAID pre op x2
- Bandage contact lens

UV-A Light 370 CXL

- Post-operative Care
- 1 day, 1 week, & 1 month recommended visits
- 4th generation fluoroquinolone qid x 4 days
- Durezol or PF taper x 3 weeks
- BCL
- HA 5% tid at surgery
- Vicodin or Percoset qid po x 2-3 days

PRK Post Surgical Pain

- Normal Course vs. Pathology
- Clinical Assessment
- Oral vs. Topical Therapy

POST-OPERATIVE CARE

- TYPICAL MEDICAL THERAPY DAY ONE
- PRED FORTE qid
- OCUFLOX qid
- BCL
- Topical NSAIDS x 2 DAYS
- CYCLO AT SURGERY
- VICODIN 10/325 PO QID
- Ibuprofen 600-800 po pre op, then 600-800 x 1or 2 before bed

Post Surgical Inflammation/ Infection

- Identify the disease
- TASS?
- Endophthalmitis
- Microbial Keratitis
- Exuberant Inflammatory response
- Smokers
- African American's / Afro-Caribbean's
- Younger patients

MRSA Infiltrate under LASIK flap Initial Treatment Treatment Ocular Pain in Infectious Disease

Diagnosis: First & Foremost
Topical Therapy
Fortified vs: Scripted antibiotics
Cycloplegics
Steroids?
Oral Pain Management

Application Ocular Pain in Phthisis

- Topical
- Atropine
- Steroids
- Oral
- Topamax
- Neurontin
- Lyrica

Bilateral Alkali Burn Analgesia in Kids: What is Best?

- Friday JH; Acad Emer Med, 2009
- 66 children, aged 5-17 y/o, with acute traumatic extremity pain > 5 on a verbal numeric scale randomized to:
- Ibuprofen 10mg /kg to max/dose 400 mg
- Acetaminophen/codeine 1mg/kg to max/ dose 60 mg
- Pain rated at baseline, 20,40,60 minutes
- Both groups had significant pain relief at all time points post Tx.
- Results: Codeine poor analgesic, Ibuprofen equal with less side effects. For more severe pain hydrocodone

Superior Limbic Keratoconjunctivitis

- Treatment
- Topical silver nitrate
- Bandage Contact lens
- Conjunctival cautery
- Conjunctival resection
- Topical Cyclosporine

Dry Eye & Ocular Pain

- Clinical Assessment
- Symptoms vs. Signs
- Initial vs. Long Term Therapy

Possible Testing During Dry Eye Evaluation

- Evaluate Tear Meniscus
- NaFl Staining & Tear Break Up Time
- Lissamine Green Staining or Rose Bengal
- Meibomian Gland Expression
- Schirmers With Anesthetic or Quick Zone
- TearLab Osmolarity System
- Dilution & Irrigation
- Naso-lacrimal probe

Tear Break Up Time Conjunctival Staining

- Moderate / Severe lissamine green staining

Schirmer Strips

Osmolarity in the Diagnosis of Dry Eye Disease

- Osmolarity is the "gold standard" test for Dry Eye
- 45 years peer reviewed research
- Osmolarity has been added to definition of Dry Eye
- Global marker of Dry Eye, indicating a concentrated tear film

KEEP IT SIMPLE AND TAKE ADVANTAGE OF PPV

- MILD RANGE:
 - 300-320 mOsmol/L
- MODERATE RANGE:
 - 320-340
- SEVERE RANGE:
 - > 340

Osmolarity & Tear Film Instability in DED

Symptoms of Dry Eye

Signs of Dry Eye

Treatments for Chronic Dry Eye

- Modify environment, habits
- Artificial tears
- Topical cyclosporine
- Topical steroids
- Secretagogues
- Nutritional supplements/vitamins
- Punctal occlusion
- Tarsorrhaphy, moist chamber goggles
- Lacriserts

Treatment Recommendations by Severity Levels

- Level 1
 - Education and environmental/dietary modifications
 - Elimination of offending systemic medications
 - Artificial tear substitutes, gels/ointments
 - Eye lid therapy

Treatment Recommendations by Severity Levels

- Level 2:
 - *If Level 1 treatments are inadequate, add:*
 - Anti-inflammatory agents
 - Tetracyclines (for meibomianitis, rosacea)
 - Punctal plugs
 - Secretagogues
- Moisture chamber spectacles

Randomized Clinical Trial of Re-esterized Triglyceride OM3 Study Protocol

- Multi Center Randomized, Masked, Placebo Controlled study.

Analysis

- Tear Osmolarity (mOsm/L)

Analysis

- Ocular Symptom Disease Questionnaire

Analysis

Dry Eye and Punctal Plugs

Dry Eye and Punctal Plugs

Treatment Recommendations by Severity Levels

- Level 3:
- *If Level 2 treatments are inadequate, add*
 - Serum
 - Contact lenses
- Permanent punctal occlusion

Treatment Recommendations by Severity Levels

- Level 4:
- *If Level 3 treatments are inadequate, add*
 - Systemic anti-inflammatory agents
- Surgery (lid surgery, tarsorrhaphy; mucus membrane, salivary gland, amniotic membrane transplantation)

Persistent Epithelial Defects Treatment

- cyanoacrylate tarsorrhaphy
 - *Indications*
 - lagophthalmos
 - exposure keratitis
 - neurotrophic keratitis
 - dry eyes
- persistent epithelial defects

Persistent Epithelial Defects Treatment

- cyanoacrylate tarsorrhaphy
- Indications
 - *lagophthalmos*
 - *exposure keratitis*
 - *neurotrophic keratitis*
 - *dry eyes*
- persistent epithelial defects

Temporary Cyanoacrylate Tarsorrhaphies

- Age (27-85) 62
- Dx:
 - Persistent epithelial defects
 - Neurotrophic keratitis
 - Exposure keratitis
 - Lagophthalmos

Product Specifications