Plenary 3- Turning Down the Heat: Quenching Inflammation & Pain

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Sunday, July 9, 2017
10:15 a.m. – 11:00 a.m.
Improving Betsy’s quality of life while reducing inflammation with more plants and less drugs

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Case Study: Betsy

- 67 yo veteran female with depression, insomnia, pre-diabetes, HTN, GERD, mild cognitive impairment and inflammatory osteoarthritis.
  Presents with worsening knee and hip pain.
- Meds: Sertraline 100 mg daily, Metformin 1000 mg twice daily, Omeprazole 40 mg daily, Nortriptyline 25 mg qhs for sleep and pain, oxybutynin XR 10 mg for stress incontinence, Naproxen Sodium 500 mg BID, ASA 160 mg daily.
- Social History: Foods she craves or eats/drinks a lot of are artificially sweetened soda (2-3 cans a day), carbs including breads and bagels. She eats red meat daily.
Heart Attacks......

God's revenge for eating his animal friends.

Some inflammatory marker pearls

- **Estimated Sedimentation Rate (ESR)** gradually rises with age. **CRP** does not.
- **IL-6** is both a cytokine and a myokine. It will go up with inflammation and muscle contraction.
- Comparing rapidity of rise and fall, **procalcitonin** changes quickest, then **CRP** and **ESR** changes the slowest.
- **Procalcitonin** is a "hormo-kine" not a cytokine and thus rises and falls more quickly than traditional inflammatory markers and thus is the best one to follow severity of infection.
- **Procalcitonin** rises with bacterial infections but not with viral infections. It also does not rise with abscesses where the bacterial infection is walled off from systemic inflammatory triggers.
- **C-reactive protein** got its name from the pneumoCoccal (emphasis on "C"occal) bacteria that reactively released this protein in people who often died of pneumococcal pneumonia before immunization.

Does nutrition influence pain?

Seafood and Plant Protein (nuts, seeds, soy, beans and peas) = Less pain

Those with the healthiest diet had less pain despite being obese

Emery CC, et al. Dietary intake mediates the relationship of body fat to pain. *ANN. 158(2), February, 2017*
**Omega 3 Fatty Acid**

Delta 6-Desaturase

- Gamma-linolenic acid (GLA)
  - Evening Primrose Oil
  - Borage Oil
  - Black Current Oil

Eicosapentaenoic Acid (EPA)

- Prostaglandins (PGE1, PGE3)
  - Favorable
  - Less Inflammatory
- Leukotrienes

**Omega 6 Fatty Acid**

Delta 5-Desaturase

- Arachidonic Acid
  - in cell membrane

Cyclo-oxygenase (COX)

- Prostaglandins (PGE2)
  - Inflammatory

Lipoxygenase

- Leukotrienes

**Pathway**

Phospholipase A-2

- Free AA

Aspirin

NSAIDs

COX II Inhibitors: Celebrex, Vioxx, Mobic

Cyclo-oxygenase Pathway

Lipoxygenase Pathway

- Prostaglandins & Thromboxanes

- Leukotrienes

Colchicine

Sulfasalazine

Leukotriene Inhibitors: Accolate, Singulair, Zyflo
You are What you Eat…..

Buttock Fat Bx of 853 Swedish Men ages 50-71

↑ Arachidonic Acid to Linoleic Acid = Mortality HR of 1.15

↑ Linoleic Acid = Mortality HR of 0.90

Ljunghman S, et al. Association of Adipose Tissue Fatty Acids With Cardiovascular and All-
Polyunsaturated
Partially Hydrogenated

30 year shelf life


Drug Classes with Anti-cholinergic effects

- Pretty much any anti-spasmotic (bladder spasm, intestinal spasm)
- Muscle relaxers
- Tricyclic antidepressants
- First generation anti-histamines
- Anti-vertigo and Anti-emetics
- Anti-psychotics
- Anti-arrhythmic
- Anti-parkinsonians

Hazard Ratio: 1.54 for dementia for highest doses


Artificially Sweetened Soda and Stroke Risk

Pase MP et al, Sugar and Artificially Sweetened Beverages and the Risks of Incident Stroke and Dementia: A Prospective Cohort Study. Stroke. May, 2017
SSRI and Bleeding Risk


Root Vegetables and Nitrates

Beet Juice for Blood Pressure

250 mL of Beet Root Juice (n=36) Vs. 250 mL of Nitrate-Free Beet Root Juice (n=36)

The Lysosome Needs Acid for Lysis

Proton Pump

H⁺
Amino Acid Cycle Running Smoothly

- Nuts
- Foliage
- Fish
- Berries
- Beans
- Olive Oil

Methylation Pathways

Serotonin
Norepinephrine
Dopamine

Methylation Cycle

Simplified

- MTHFR
- Folate
- B6
- B12
- SAme
- 5-MTHF
- 5-HT (SE)
- NE
- Dopamine
- BBB
Cycle Stagnation

Nuts, Foliage, Fish, Berries, Olive Oil

MTHFR Defect

Homocystine

Folate
B6
B12
SAMe

Serotonin
Norepinephrine
Dopamine

Prevalence (a) of depression according to baseline levels of folate, vitamin B12 and homocysteine.

Kim J et al. BJPsych 2008;192:268-274

Homocystine

NNT = 6
Light Therapy Works - No Matter the Season

Is it the Grape or the ETOH?
5 oz Nightly


- Flavonoids found in dark berries, grapes and green tea.
- Pycnogenol, 50 mg TID vs diosmin/hesperidin 450/50 mg BID.
- Micronized flavonoid (Daflon): Being considered by the FDA.


- 149 studies
- OA of Knee
- 3 mth duration
Open Label Placebo for LBP

**Patient Education**
1. The placebo effect can be powerful
2. The body can respond to placebo similar to Pavlov’s dog
3. A positive attitude can be helpful and...
4. Taking the pills faithfully for 21 days is critical


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Open Label Placebo for LBP

A
B

NOACS

Usual Treatment | Placebo

Usual Treatment | Open Placebo

p<.001


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MOVES Trial
GC vs Celecoxib for OA of Knee

WOMAC pain scores decreased by 50% in both groups.

Chondroitin for Hand OA

562 pts. Avg age: 63. Mostly Women
800 mg chondroitin daily (Condrosulf)

Improvement in Pain and Function and shorter duration of morning stiffness

Similar improvement as NSAIDs


Curcumin

Curcumin: Modulation of COX-2 and LOX
Curcumin vs Ibuprofen for OA of the Knee

![Graph showing WOMAC total score for Curcumin and Ibuprofen]


Ginger

![Image of ginger]

Ginger Clinical Trial OA

![Graph showing Pain on standing for Ginger and Placebo]

Altman R D & Marcussen K C. Arthritis & Rheumatism 2001 44 (11): 2531-34
What would you recommend for Betsy?

- Improve nutrition, less soda, eat more omega-3 fatty acids and plants. Reduce sources of arachidonic acid.
- Taper off PPI, NSAID or SSRI and anti-cholinergic meds.
- Add Curcumin 1 gm twice daily with pepper. (High doses = NSAIDS)
- Glucosamine 750 mg BID and Chondroitin 1200 mg daily
- Add bioflavonoids, pycnogenol 50 mg TID.
- Acupuncture for OA of pain.