Integrative Medicine Approach to Headaches

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Introduction

- Headaches are commonly encountered in primary care
- History is key to differentiate type of headache
- Type of headache helps direct best approach; differential diagnosis:
  - Most common: migraines and tension-type headaches (90%)
  - Less common:
    - Head/neck structures (TMJ, dental, cervical spine, sinuses)
    - Mass or CNS infection
    - Other

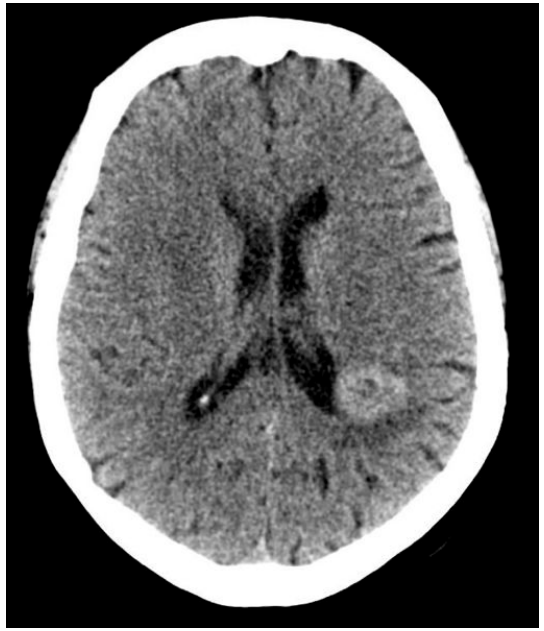
J.D. Goldstein, C.A. Camargo Jr., A.J. Pelletier, J.A. Edlow: Headache in United States emergency departments: demographics, work-up and frequency of pathological diagnoses. *Cephalalgia.* 6:684-690 2006

Case 1

- Melissa is a healthy 24-year-old female who reports that she has been having dull, left-sided headaches for the past few months. They occur most days, and are somewhat relieved with Tylenol or ibuprofen. She is otherwise healthy.
- For the past two weeks, she has been having strange “episodes,” where she feels “like a pit” in her stomach, sees “bits of white light” in her vision, has trouble speaking (difficult word finding), and feels strange. These episodes last for about one minute and then resolve. She is awake during the whole thing and feels fine afterwards. No specific things seem to trigger these episodes, and they have been happening 1-2 times per day, most days.

Case 1

- New-onset seizures are a red flag symptom
- This patient has a brain tumor!



Red Flag Symptoms

- New onset of “worst headache” of a person’s life
- Seizures
- Headaches associated with mental status changes or focal motor/sensory symptoms
- Headaches with fever, stiff neck, or systemic signs of illness
- Headaches associated with double vision / visual changes
- Headaches in patients at risk for metastases (i.e. history of breast cancer)
- …nothing integrative about these situations → prompt evaluation/imaging!

Case 2

- 27-year-old previously healthy male
- Has had mild headaches for years, but always resolved with ibuprofen
- Started working a new job with more stress over the summer, and started developing new, more severe headaches
- Describes headaches as starting on left side, frontal/temporal. Feels throbbing, made worse by bright lights. 6-8/10 in intensity. Symptoms last 1-2 days then resolve. Happening about once per week and sometimes causes him to miss work. Ibuprofen no longer effective

Case 2 - Migraine

Diagnostic criteria:

A. At least five attacks fulfilling criteria B-D

B. Headache attacks lasting 4-72 hr (untreated or unsuccessfully treated)

C. Headache has at least two of the following four characteristics:
   - unilateral location
   - pulsating quality
   - moderate or severe pain intensity
   - aggravation by or causing avoidance of routine physical activity (eg, walking or climbing stairs)

D. During headache at least one of the following:
   - nausea and/or vomiting
   - photophobia and phonophobia

E. Not better accounted for by another ICHD-3 diagnosis.

International Classification of Headache Disorders, 3rd Edition:
https://www.ichd-3.org/1-migraine/1-1-migraine-without-aura/

Migraines

- Strong genetic influence: typically 1 or more other family members affected
- Affects younger adults (starting in adolescence and continuing in adulthood)
- 15-20% lifetime prevalence, with 3:1 female-to-male ratio (1)
- Large economic impact from loss of productivity in working adults
- Pathophysiology:
  - Not entirely understood, but several suggested mechanisms
  - Neurovascular disorder – vasodilators released by trigeminal nerve result in inflammation and edema of blood vessels in scalp and meninges (2)
  - Over time, the trigeminovascular neurons become sensitized, and start to respond (release vasodilating substances – substance P, calcitonin gene-related peptide) to less intense triggers, and thus migraines worsen and increase in frequency (2, 3)

1. W.F. Stewart, C. Wood, M.L. Reed, J. Roy, R.B. Lipton: AMPP Advisory Group. Cumulative lifetime migraine incidence in women and men. *Cephalalgia.* 28:1170-1178 2008. 2. Tfekt-Hansen, H. Le: Calcitonin gene-related peptide in blood: is it increased in the external jugular view during migraine and cluster headache? A review. *J Headache Pain.*10:137-142 2009. 3. R Burstein, R Noseda, D Borsook: Migraine: Multiple Processes, Complex Pathophysiology. Journal of Neuroscience 29 April 2015, 35 (17) 6619-6629

Migraines: Acute Management

- Triptan medications: Sumatriptan, Rizatriptan, etc
- NSAID medication (can give Toradol IM in clinic)
- Excedrin migraine (acetaminophen, aspirin, and caffeine)
- Avoid acute triggers (dark, quiet room)
- Stay hydrated and rest
- Ginger tea for nausea, peppermint aroma therapy/peppermint oil
- Practiced mindfulness, relaxation techniques, gentle stretching, massage
- If severe or no relief → ER for acute treatment

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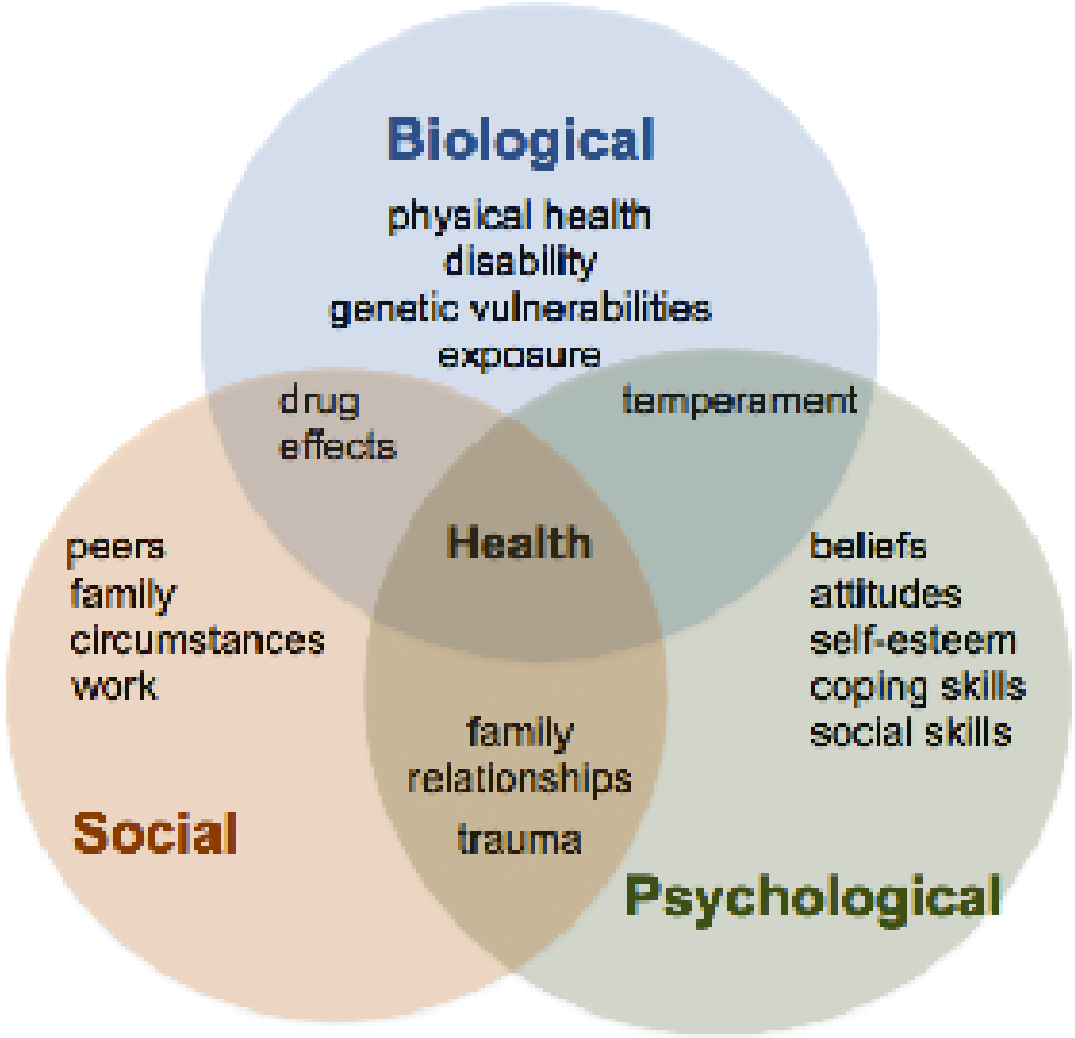
Migraine Prevention

- Pharmaceuticals, can be effective, but can have side effects:
  - Propranolol: 60-180mg daily
  - Amitriptyline 10-150mg qhs, Nortriptyline up to 75mg qhs
  - Topiramate: 25mg qhs x 1 week, increase by 25mg weekly up to 50mg BID
  - Verapamil SR: 180-240mg qhs
  - Venlafaxine (if co-morbid depression): start 37.5mg, increase to 75-150mg daily
  - Botulinum toxin: SQ 100mg every 3 months

Migraine Prevention



Migraine Prevention

- Take a good history:
  - Lifestyle:
    - Sleep hygiene
    - Smoking
    - Regular exercise
    - Stress management
    - Diet; food triggers; hydration

Migraine Prevention

- Take a good history:
  - Foods:
    - Dietary triggers found in 8-20% of those with migraines (1)
    - Most common triggers are foods with tyramine or phenylethylamine, including chocolate, aged cheeses, red wine and vinegars, soy, nuts, and citrus fruits
    - Food allergies: Wheat, dairy, soy, eggs, peanuts
      - Consider trial of elimination diet
    - Alcohol and caffeine (caffeine withdrawal can trigger migraines)
    - Improving omega 3 : omega 6 ratio improved symptoms in study of 65 individuals (2)
    - Headache diary can help patients understand possible food triggers

1. J.G. Millichap, M.M. Yee: The diet factor in pediatric and adolescent migraine. *Ped Neurol.* 28:9-15 2003. 2. C.E. Ramsden, K.R. Faurot, D. Zamora, et al.: Targeted alteration of dietary n-3 and n-6 fatty acids for the treatment of chronic headaches: a randomized trial. *Pain.* 154:2441-24512013

Migraine Prevention

- Take a good history:
  - Environmental triggers:
    - Odors
    - Excessive noise or bright lights
    - Work
    - Psychological stressors

Migraine Prevention

- Lifestyle Recommendations:
  - Engage in regular exercise
  - Limit or avoid caffeine, alcohol, cigarettes, and perfumes/strong odors
  - Keep a headache diary to look for triggers
  - Sleep hygiene
  - Practice meditation and other stress reduction exercises
  - Eat real food: Mediterranean, anti-inflammatory, plant-based diet. Aim to improve omega 3:omega 6 ratio through diet

Migraine Prevention: Supplements

- Magnesium
  - Has been shown in studies to reduce frequency of migraines compared to placebo
  - Also useful for chronic fatigue, fibromyalgia, mood, and can be calming and help regulate circadian cycle
  - Dose: 200-1000mg (as tolerated, usually 400-800mg) daily, recommend in the evening
  - Chelated magnesium or magnesium glycinate are usually better tolerated with fewer GI side effects. Magnesium oxide is cheaper, but poorly absorbed and more likely to cause diarrhea

A. Peikert, C. Wilimzig, R. Kohne-Volland: Prophylaxis of migraine with oral magnesium. Results from a prospective, multi-center, placebo-controlled and double-blind randomized study. *Cephalalgia.* 16:257-263 1996

Migraine Prevention: Supplements

- Riboflavin (Vitamin B2) 200mg twice daily:
  - Precursor for two coenzymes involved in redox reactions. May improve mitochondrial energy reserves in neurons
  - Studies show improvement in preventing migraines compared to placebo (1)
  - May have synergistic preventive effects when used with beta blocker (2)

1. C. Boehnke, U. Reuter, U. Flach, S. Schuh-Hofer, K.M.Einhaupl, G. Arnold: High-dose riboflavin treatment is efficacious in migraine prophylaxis: an open study in a tertiary care centre. *Eur J Neurol.* 11:475-477 2004 2. P.S. Sandor, J. Afra, A. Ambrosini, J. Schoenen: Prophylactic treatment of migraine with beta-blockers and riboflavin: differential effects on the intensity dependence of auditory evoked cortical potentials. *Headache.* 40:30-35 2000

Migraine Prevention: Supplements

- Coenzyme Q10 (ubiquinone)
  - Endogenously produced and serves as cofactor in oxidation in Krebs cycle and involved in electron transport chain
  - Fat-soluble antioxidant
  - RCT in 42 patients showed decrease in frequency of migraines at 3 months (47.6% reduction compared to 14.4% in placebo), but not shown to decrease severity or duration of migraines when they occur
  - May take up to three months to notice full effects
  - Great safety profile
  - Dosing: 150-300mg daily (or divided BID)

P.S. Sandor, L. Di Clemente, G. Coppola, et al.: Efficacy of coenzyme Q10 in migraine prophylaxis: a randomized controlled trial. *Neurology.* 64:713-715 2005

Migraine Prevention: Supplements

- Botanicals
  - Feverfew, 125mg/day of dried leaf extract:
    - Studies suggest up to 70% reduction in headache frequency and severity (1)
    - Generally well-tolerated; aphthous ulcers and GI discomfort most common side effects
    - Abrupt cessation can cause rebound headache
    - Not recommended in pregnancy (prolonged bleeding time)
  - Butterbur, 50mg TID for a month, then BID
    - Three-arm RCT found reduction in frequency of migraines by 50% (2)
    - Excessive belching is most common side effect
  - Ginger, as tea (steep boiling water for 10 minutes), or 1 gram powdered 4x daily
    - Helpful for headaches with nausea (3)

1. J.J. Murphy, S. Heptinstall, J.R. Mitchell: Randomised double-blind placebo-controlled trial of feverfew in migraine prevention. *Lancet.* 1988 189-192 2. R.B. Lipton, H. Gobel, K.M. Einhaupl, et al.: Petasites hybridusroot (butterbur) is an effective preventive treatment for migraine. *Neurology.* 63:2240-2244 2004. 3. D. Rakel: Integrative Medicine, 4th edition. 2017

Migraine Prevention: Supplements

- Safe options for sleep:
  - Melatonin 3-10mg
    - Useful for improving sleep and helping with circadian rhythms
    - Generally safe and well-tolerated
  - Valerian root, 100-300mg at night
    - Useful for insomnia, also can be used 250mg TID as needed for anxiety
    - Generally not addictive and does not impair psychomotor or cognitive performance
    - Not recommended in pregnancy (insufficient information)

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Migraine Prevention: Combination Products

- Several combination products marketed for migraine prevention exist:
  - MigRelief
    - Magnesium (as citrate and oxide), B2, and Feverfew
  - MigShield
    - B2 200 mg, Magnesium 200 mg, and CoQ10 75mg
  - Migraine Stop (migrainestop.com)
    - Magnesium (chelated), B6, Passionflower

Migraines: Manual Therapies

- Craniosacral therapy:
  - Gentle, hands-on method, using generally less than five grams of pressure used to release restrictions in craniosacral system and optimize CNS function
- Chiropractic therapy:
  - Systematic review showed that chiropractic manipulation as effective as propranolol and topiramate for prophylaxis, though study designs were flawed and more research recommended
- Massage:
  - Can be relaxing and calming, and may help reduce migraine frequency. Less evidence compared to others.

A. Chaibi, P.J. Tuchin, M.B. Russell: Manual therapies for migraine: a systematic review. *J Headache Pain.* 12 (2):127-133. 2011

Migraines: Acupuncture

- Acupuncture (6-8 sessions over 8 weeks):
  - Meta-analysis of 22 trials and 4419 individuals showed acupuncture more effective with fewer adverse side effects compared to prophylactic drug treatment
  - 2016 Cochrane Review found acupuncture superior to no treatment (CI 2.08-2.76, NNT 4) and sham acupuncture (CI 1.11-1.36, NNT 11) for prevention of episodic migraines. Acupuncture was also superior to prophylactic medications (beta blockers, valproic acid, topiramate) after treatment (CI 1.08-1.44, headaches halved in 57% acupuncture group vs. 46% drug groups), but not maintained at 6 month follow-up (59% vs 54%)
  - Can be useful as an adjunct to routine care or as primary preventive treatment
  - Cost, especially in Michigan, can be a problem for patients

1. K. Linde, G. Allais, B. Brinkhaus, E. Manheimer, A. Vickers,A.R. White: Acupuncture for migraine prophylaxis. *Cochrane Database Syst Rev.* 2009. 2. K. Linde et al. Acupuncture for the prevention of episodic migraine. *Cochrane Database Syst Rev.* 2016

Migraine Prevention: Other

- Mindfulness meditation and relaxation techniques:
  - Safe and recommended for everyone!
  - Progressive muscle relaxation, focused breathing exercises, and guided imagery are all useful
  - Apps: Headspace, Insight Timer, Calm, Jon Kabat-Zinn JKZ2 and JKZ3
  - Book option: Search Inside Yourself by Chade-Meng Tan
  - MBSR, Yoga, Tai Chi, Qigong
- Biofeedback and Cognitive-Behavioral Therapy
  - Can be useful as adjuncts
  - Help to train individuals regarding stress management and self-soothing

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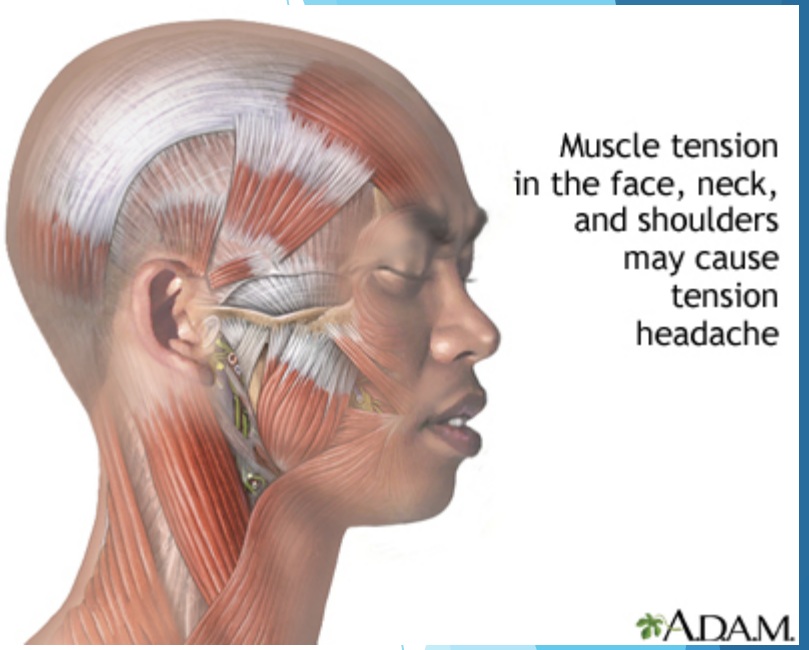
Case 3

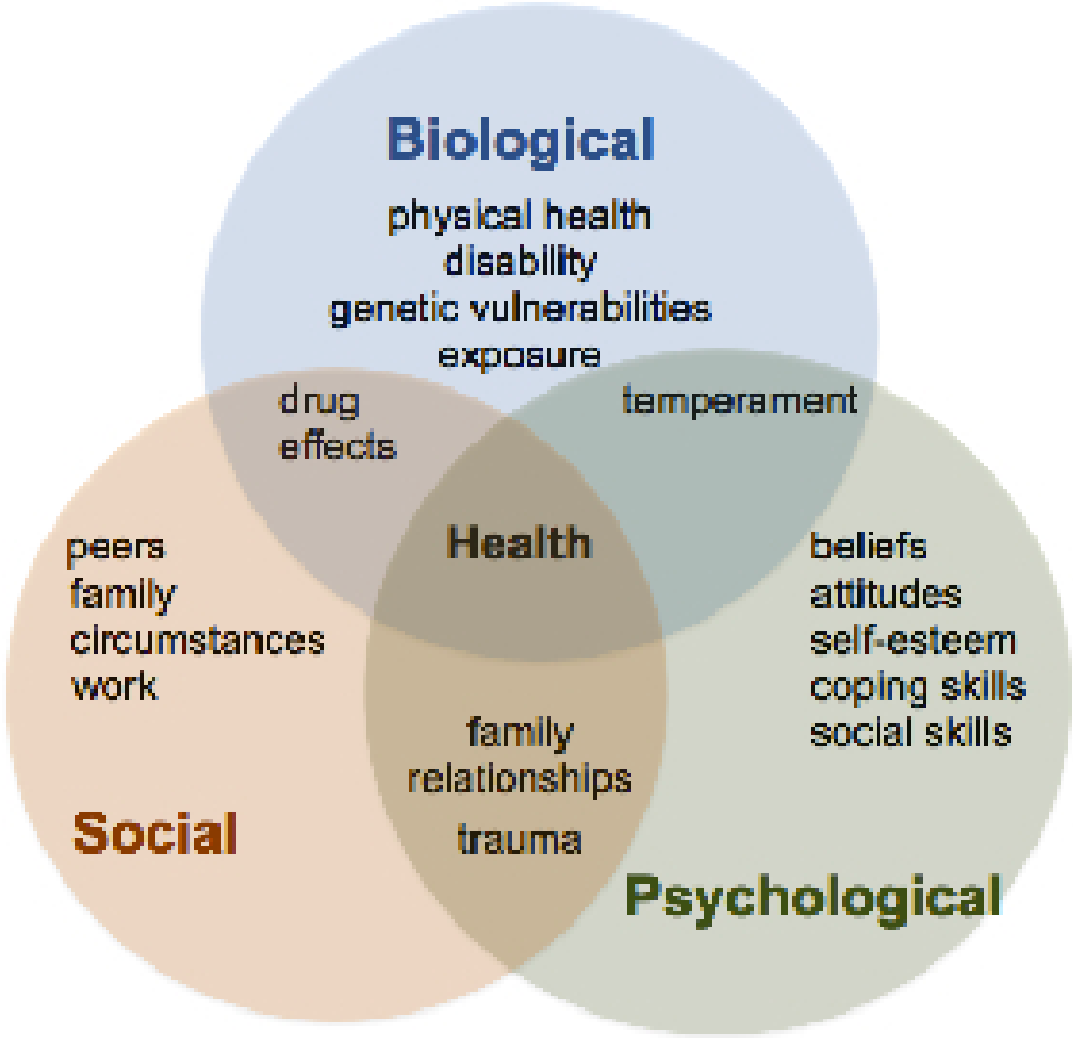
- 45-year-old male presents complaining of frequent headaches for past few months, now worsening
- Describes pain as dull and achy; bilateral, worst in the temples and also at times at the base of his neck posteriorly/occipital scalp
- Usually wakes up with the pain, and sometimes comes and goes during the day. Gets some relief with ibuprofen and Tylenol
- On further questioning, describes increased stress at home and at work. Not sleeping well, and diet and exercise have also worsened due to not having enough time

Case 3 – Tension Headaches

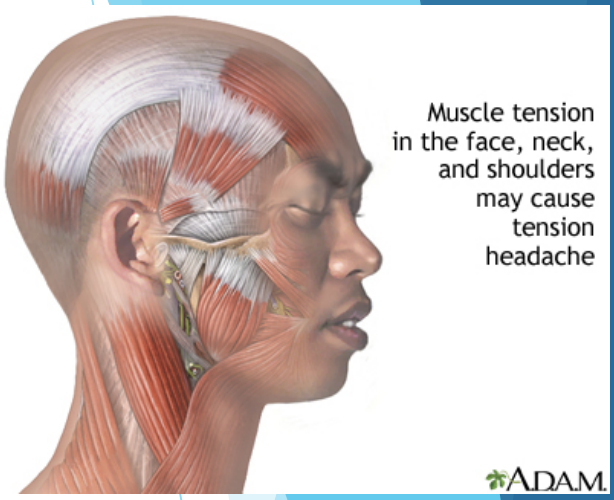
- Pain is typically bilateral, non-throbbing
- Trigger points: temples, masseters, forehead, and base of skull
- Overlap with TMJ dysfunction and teeth clenching/grinding
- Has overlap with migraines
  - Several of same treatment options apply to both types of headaches



Case 2 – Tension Headache Prevention



Case 3 – Tension Headaches: Think posture, muscle tension, and stress



- Mind-body and lifestyle therapies effective for tension headaches and migraines:
  - stress management, biofeedback, mindfulness meditation, yoga and other movement therapies, guided imagery
  - Sleep hygiene
  - Regular exercise
  - Review diet and aim for anti-inflammatory, Mediterranean diet
- Pharmaceuticals (less effective than in migraines):
  - Triptans less effective
  - NSAIDs and Tylenol may be useful as needed, but avoid daily and long-term use.
  - Turmeric as anti-inflammatory supplement that can be useful: 400-500 mg 1-2 x daily
  - Muscle Relaxants: Short-term benefit but may lead to rebound headaches

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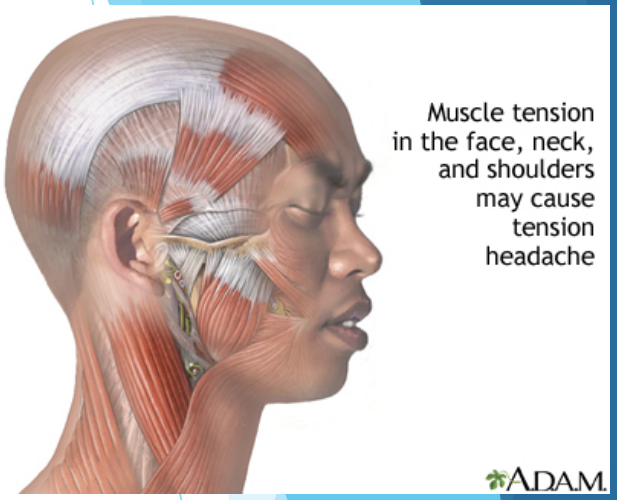
Case 3 – Tension Headaches



- Tension headaches: Think posture, muscle tension, and stress. Bigger role for manual therapies
  - Physical therapy: Heterogeneous types of therapies studied, with mixed results. Mostly safe and can be effective (1)
    - Myofascial release, cervical traction, trigger point therapy, cervical thoracic muscle stretching, progressive relaxation techniques, massage, and others
  - Chiropractic: Mixed data, but small studies have shown effectiveness (2)
  - Massage therapy: Effective and safe; high-powered studies are limited
  - Acupuncture
    - Systematic review of five trials demonstrated small but significant benefits. More studies needed, but may be useful for patients with frequent tension headaches (3)

1. G.V. Espi-Lopez et al. Effectiveness of Physical Therapy in Patients with Tension-type Headache: Literature Review. J Jpn Phy Therapy Assoc. 2014. 2. D. Rakel: Integrative Medicine, 4th edition. 2017. 3. K. Linde, G. Allais, B. Brinkhaus, et al.: Acupuncture for tension-type headache. *Cochrane Database Syst Rev.*

Approaches to Headache Prevention and Management

Prevention:

A) Lifestyle:

-Regular meals and sleep, sleep hygiene, aerobic exercise at least 3 times per week, headache calendar / journal, stress management, avoidance of environmental triggers

-Discontinue possible pharmaceutical triggers, including hormonal OCP if menstrual

B) Nutrition:

-Elimination of common food triggers: wine, aged cheese, processed meats, cashews, caffeine. UW Handout: http://www.fammed.wisc.edu/files/webfm-uploads/documents/outreach/im/handout_ha_elim_diet_patient.pdf

C) Supplements:

-Chelated magnesium or magnesium glycinate (avoid magnesium oxide) 200-800mg titrate to side effects (loose stools)

-Riboflavin (Vitamin B2): 200mg twice daily

-Coenzyme Q10: 150-300mg daily or divided twice daily

D) Botanicals:

-Feverfew: 125mg up to 3x daily

-Butterbur: 50mg 3x daily

-For sleep: Valerian root extract: 100-300mg at night, or melatonin 3-10mg at night

E) Pharmaceuticals:
-Amitriptyline: 10-150mg at night / Nortriptyline titrate to 75mg at night
-Propranolol: 60-180mg daily
-Topiramate: 25 mg qHS x1 week, 25 mg BID x1 week, 25 mg qam, 50 mg qHS x1 week, 50 mg BID
-Verapamil: 18-480mg daily
-Botulinum toxin: SQ 100mg every 3 months

F) Mind-Body Therapy / Other
-Physical / manipulation therapy
-Biofeedback / Neurofeedback (10 sessions)
-MBSR - 8-week course
-Acupuncture (6-8 sessions over 8 weeks, repeat as-needed)
-Massage, craniosacral therapy, chiropractic (less evidence)

Acute Treatment:
-Dark, quiet environment, stay hydrated and eat if possible, sleep
-Ginger tea for nausea and peppermint aroma therapy
-Naproxen 250-500mg every 4 hours as needed (or ibuprofen
-Triptans
- OTC migraine medications (Excedrin)
-Peppermint oil to temples
-Practiced neurofeedback and relaxation techniques, massage, slow stretching, acupuncture, reiki

References:

- J.D. Goldstein, C.A. Camargo Jr., A.J. Pelletier, J.A. Edlow: Headache in United States emergency departments: demographics, work-up and frequency of pathological diagnoses. *Cephalalgia.* 6:684-690 2006
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