Post-Traumatic Headaches

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Objectives

• What is post-traumatic headache? What are the different populations that get them?
• What types of pharmacologic treatments are there for rescue treatment?
• What types of pharmacologic treatments are there for preventative treatment?
• How can you tell the difference between post-traumatic headache and migraine or other primary headache syndrome?
Concussion and Migraine

- Personal or family history of migraine observed in 80+% of symptomatic mild TBI
- Why is there so much comorbidity?
  - Thought that hyperexcitability of the brain in migraine sufferers can lead to increased risk of sustaining concussion
  - We know a pre-existing headache disorder like migraine is associated with an increased risk of worsened and prolonged symptoms after a concussion.
  - Peripheral activation of the trigeminocervical complex? This is the pain generator in the brain.


Acute Post-traumatic headache

• Most common symptom after minor head injury
• 94% of athletes with sports-related concussion have headache

Acute Post-traumatic headache

- A. Any headache fulfilling criteria C and D
- B. Traumatic injury to the head has occurred
- C. Headache is reported to have developed within 7 days of one of the following:
  1. the injury to the head
  2. regaining consciousness following injury to the head
  3. Discontinuation of medication(s) that impair the ability to sense or report headache following the injury to the head
- D. Either of the following:
  1. headache has resolved within 3 months after the injury to the head
  2. headache has not yet resolved but 3 months have not yet passed since the injury to the head

- Persistent post-traumatic headache = the above criteria but greater than 3 months.
- Similar criteria for “whiplash” headaches

- Source: ichd-3.org
Populations

• Some VERY different populations:
  – Military
  – Athletes
  – Accident victims
  – Assault victims
  – Workplace injury

• We always ask about pending litigation, worker’s compensation claims, and of course future plans in sport with athletes.
Taking a Headache History

- Family history of migraine?
- Personal history of migraine?
- Detailed previous concussion history. Did they have headaches afterwards? How long? Were they like these?
- Location, length, character (Dull? Throbbing?), radiation, severity, time to build up, time of day when pain is worst or when headache starts, onset
- Associated symptoms: dizzy, nausea, vomiting, aura, photophobia, phonophobia, neck pain
- What is the patient taking for the pain?
- Triggers?
- Missing school/work due to headaches?
- Worsening with activity?
How to treat?

- No randomized controlled clinical trials in PTH treatment
- Standard of care is treating the headache like the primary headache type it most resembles (usually migraine)
IV Rescue Treatment

- In our neurology infusion center we will use various combinations of intravenous medications to break severe migraine attacks and cycles, including post-traumatic headache.

- Retrospective study by Chan et al showed that among patients with mild TBI treated with combinations of prochlorperazine, ketorolac, ondansetron, or metoclopramide, patients treated with highest rate of treatment success received either prochlorperazine or metoclopramide alone.

- An earlier 1994 study showed evidence for dihydroergotamine (DHE) and metoclopramide for headache after concussion.


Options for Home Rescue Therapy

- Acetaminophen
- NSAIDs, including prescription indomethacin, diclofenac, etodolac, etc.
- Combination analgesics (acetaminophen/caffeine/aspirin). AVOID butalbital-containing compounds due to risk of medication overuse headaches
- Triptans
- Ergots
  - DHE (subcutaneous or nasal spray)
- Anti-nausea medications
- Newer medications like gepants and lasmiditan

Clinical Pearls for Abortive Treatment

• Avoid certain medications in patients with stroke or heart attack, like triptans or NSAIDs

• **Avoid medication overuse headaches.** Limit all rescue medication use to 10 days/month or less. Exception is muscle relaxants and anti-emetics.

• Oral steroid tapers can sometimes break bad headache cycles.

• Another option is scheduled muscle relaxers or Valproic acid for a certain number of days

• Sometimes infusion therapy is warranted.
Preventative Treatments

• What evidence is there for treatments in post-traumatic headache?
• For now, we use migraine or tension-type headache treatments
Amitriptyline

- Weiss et al (propranolol and/or amitriptyline) and Tyler showed benefit of amitriptyline in post-traumatic headache.
- Saran found in 1988 that amitriptyline was Ineffective.
- Retrospective studies!
- Side effects: weight gain, dry mouth, constipation. Avoid in those with arrhythmias.
Valproic Acid

• Packard found that in 100 patients with chronic post-traumatic headache, 60% had mild to moderate improvement in headaches after one month.

• Side effects: very toxic to fetus (generally don’t have to child-bearing age females), blood count derangements, tremor, weight gain, alopecia. Contraindicated in liver failure.

• Retrospective!
Topiramate

- Erickson in 2011 found that there was a significant decline in headaches after TBI in soldiers when using topiramate.
- Side effects: nephrolithiasis, paresthesias, weight loss, cognitive dysfunction, word-finding difficulty, acute angle-closure glaucoma
- Retrospective! Look at the population as well.
Other Oral Medications

• Other migraine-specific medications we sometimes use “off-label” in post-traumatic headache:
  – Beta Blockers
  – Memantine
  – Candesartan
  – Nortriptyline
  – Venlafaxine or desvenlafaxine
Interventional Treatment in PTH

- Several retrospective studies show benefit for occipital nerve blocks
- A few small studies and lots of anecdotal evidence are promising for physical therapy of the neck in PTH
- Others: SPG block has case reports in PTH


• 64 (63 of them men) active duty military members underwent injections after mild TBI.
• Most received PREEMPT protocol – standard protocol for chronic migraine
• 64% felt better
• Retrospective!
What’s new in Migraine?

• Single pulse transcranial magnetic stimulation (TMS)
  – Small positive study in the similar repetitive TMS for persistent PTH in 2020.

• Transcutaneous supraorbital neurostimulation

• Noninvasive vagal nerve stimulation

• Caloric vestibular stimulation
  – Not yet FDA approved

• Calcitonin gene-related peptide antibodies and antagonists

• Serotonin (5-HT)₁F agonist
  – Triptan without vasoactive properties
CGRP

- Open label
- At baseline mean headache days were 15.7, reduced by mean of 2.8 days/month on Erenumab 140 mg monthly.
Alternatives

• Cognitive behavioral therapy = mixed results
• Biofeedback studies in PTH promising, however many trials were combined with some other modalities. Also small N of patients
• One positive study in servicepeople for acupuncture
• We use some migraine treatments “off-label” including “nutriceuticals” like magnesium, coenzymeQ10, and riboflavin.
General Pearls

- Headache lifestyle is very important: keep caffeine intake steady, hydration, exercise, sleep, regular meals, mood.
- Avoid analgesic medication overuse
- Encourage a multidisciplinary approach with psychology, physical therapy (and vestibular, occupational, and/or speech therapy for other concussion symptoms).
Thank You!