Post Traumatic Headache

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Faculty Disclosures

TAD SEIFERT, MD
Dr. Seifert has nothing to disclose.

DONNA GUTTERMAN, PHARM D
Dr. Gutterman has received consulting fees and/or honoraria from NuPathe, Teva Pharmaceuticals, Dr. Reddy Pharmaceuticals.

Learning Objectives

At the conclusion of this presentation, participants should be able to:
• List the defining features of posttraumatic headache
• Develop treatment plans for patients in the acute/subacute stage of injury and with chronic postconcussive headache
• Describe the key components of concussion management in the Zurich statement
• Individualize Return To Play decisions
PTH in Civilians

Posttraumatic Headache

Most common symptom after minor head trauma

Up to 90% of individuals sustaining mTBI

Occurs in ≈94% of athletes with sports-related concussion


Posttraumatic Headache in ICHD-3

5.1.2 Acute post-traumatic headache attributed to mild traumatic injury to the head
Headache develops ≤7 days of trauma

5.1.2.1 Delayed-onset acute headache attributed to mild traumatic injury to the head
Interval between injury and headache onset is >7 days
Posttraumatic Headache in ICHD-3 cont.

5.1.2 Acute post-traumatic headache attributed to mild traumatic injury to the head
Headache develops ≤7 days of trauma

5.1.2.1 Delayed-onset acute headache
Headache develops >7 days of trauma

5.2 Persistent headache attributed to traumatic injury to the head*
Headache >3 months caused by traumatic injury to the head

* Coded as “chronic post-traumatic headache” in ICHD-III.

Characteristics of Posttraumatic Headache

Phenotype of Headache following TBI (N=378)

- 38% Migraine
- 25% Probable migraine
- 21% Tension-type
- 10% Cervicogenic
- 6% Other


Posttraumatic Headache Treatment

Treated as the primary headache disorder it most closely resembles

- Acute treatment
- Preventive treatment
### Treatment Studies in TBI

<table>
<thead>
<tr>
<th>Study</th>
<th>TBI Severity</th>
<th>Intervention</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friedman et al</td>
<td>Mild</td>
<td>Ketoprofen</td>
<td>Decreased HA burden</td>
</tr>
<tr>
<td>Gawel et al</td>
<td>Not specified</td>
<td>Sumatriptan</td>
<td>Decreased Frontal Sx</td>
</tr>
<tr>
<td>Packard</td>
<td>Mild</td>
<td>Valproic Acid</td>
<td>44% improved 25-50%</td>
</tr>
<tr>
<td>Saran</td>
<td>Mild</td>
<td>Amitriptyline</td>
<td>No improvement</td>
</tr>
<tr>
<td>Hecht</td>
<td>Mixed*</td>
<td>5% bupivacaine blocks</td>
<td>80% complete relief</td>
</tr>
<tr>
<td>Lay and Newman</td>
<td>Mild</td>
<td>Indomethacin</td>
<td>HA improved</td>
</tr>
<tr>
<td>McBeath and Nanda</td>
<td>Not specified</td>
<td>IV ergotamine + metoclopramide</td>
<td>85% good/excellent response</td>
</tr>
<tr>
<td>Weiss et al</td>
<td>Mild</td>
<td>Propranolol and/or amitriptyline</td>
<td>21/30 w/reduced HA frequency</td>
</tr>
<tr>
<td>Matharu and Goadsby</td>
<td>Mild</td>
<td>Indomethacin</td>
<td>HA resolution</td>
</tr>
<tr>
<td>Wright</td>
<td>Mild</td>
<td>Amitriptyline</td>
<td>HA improvement</td>
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</table>

*Some mTBI

### PTH Treatment

**Nonpharmacologic**
- Therapeutic massage and physical therapy
- Cognitive behavioral therapy
- Education regarding overuse of acute medications

**Pharmacologic**
- Nerve blocks
- OnabotulinumtoxinA
Risk Factors for Persistent PTH

- Personal history of headache
- Family history of headache
- Female gender
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- Family history of headache
- Female gender
- Chronic pain prior to injury
- Symptoms of depression
- Low socioeconomic status
### Risk Factors for Persistent PTH

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*Inversely related to severity of trauma*

### PTH in Military Personnel

### Prevalence of Military TBI

- 2.6 million returning veterans
- Up to 20% have a TBI
- 33% meet criteria for chronic PTH

≈ 173,000 with chronic PTH

Causes of Military TBI

Defense and Veterans Brain Injury Center; data through 31 October 2008.

- Blast: 54%
- Multiple: 27%
- Vehicular: 6%
- Falls: 6%
- Other: 4%
- Bullet (2%)
- Fragment (1%)

PTH in the Military

- Only 18.7% of those with persistent PTH return to combat

Negative predictors
- Smoking
- Psychiatric comorbidities
- Male sex
- Enlisted rank

Comorbid Conditions Common in Soldiers With Persistent PTH
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- PTSD
- Persistent PTH
- Substance abuse
- Nightmares
Comorbid Conditions Common in Soldiers With Persistent PTH

- PTSD
- Nightmares
- Substance abuse
- Insomnia
- Nightmares
- Memory complaints
- Depression
- Substance abuse
- Memory complaints
Managing Persistent PTH in Veterans

- Screen for and address comorbidities
  - PTSD
  - Depression
  - Insomnia
- Refer to psychiatric services if indicated
- Identify/Address medication overuse
- Triptans for acute headache attacks
- Close follow-up to:
  - Monitor therapeutic response
  - Adjust therapy
- Provide education

Discuss expectations

PTH Among Athletes
80-90% of athletes will recover within 7-10 days of injury.

What about neurophysiological recovery?
Delay between neural and behaviorally assessed recovery after concussion

Longitudinal fMRI study in concussed subjects

• Persistent, significantly increased activation
  - 2 minus 1 n-back contrast in DLPFC
  - Inferior parietal lobe
• No significant differences on standard memory tasks (vs controls)

Functional brain activation differences persist at 2 months after injury in concussed athletes

Two Big Questions. . .

1. How do we approach headache in the acute/subacute stage of injury?

How do we approach the athlete with persistent headache?
Two Big Questions. . .

1. How do we approach headache in the acute/subacute stage of injury?

2. How do we approach the athlete with persistent headache?

Headache in the Acute/Subacute Stage

“While symptomatic following an injury, it is important to emphasize to the athlete that physical AND cognitive rest is required.”

Dark closet effect

Headache in the Acute/Subacute Stage

"While symptomatic following an injury, it is important to emphasize to the athlete that physical AND cognitive rest is **required.**"

**Dark closet effect**

"**Wait and pray**" approach

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Symptom-limited Physical and Cognitive Rest

**Zurich Consensus Statement 2012**

The cornerstone of concussion management is **symptom-limited** physical and cognitive rest until the acute symptoms resolve and then a graded program of exertion prior to medical clearance and RTP.

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When to **Start Exercise**?

Previous best practice suggested waiting until athletes were **asymptomatic**

- Assessment method (written vs oral)
- Social Factors/ Sport Culture
- Motivation
- Personality
- Comorbidities (anxiety, depression, migraine)
**PTH ARS Question 1**

Which of the following is true about postconcussive athletes?

A. They experience higher rates of anxiety and depression than the general population
B. Once asymptomatic, they can immediately return to competition
C. They should avoid physical and mental exertion during the acute stage of injury
D. All of the above

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**What Is Asymptomatic?**

What percentage of non-injured people report concussion-like symptoms?

36–76%

Concussed and non-concussed athletes report some degree of symptoms throughout the season

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What Is *Asymptomatic*?

What percentage of non-injured people report concussion-like symptoms?

**36–76%**

Concussed and non-concussed athletes report some degree of symptoms throughout the season

Failure to achieve asymptomatic status does not necessarily mean incomplete recovery from concussion

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Posttraumatic Headache *cont.*

Occurs in ≈94% of athletes with sports-related concussion

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Key Point

Headache in the athlete is not uncommon.
Headache in the Athlete

- Cyclists: 50%
- College Athletes: 36%
- Distance Runners: 36%
- Adolescents (13–15) with Exertional HA: 30%

2% of population have given up sports participation due to primary exertional HA

Is Pre-existing Migraine a Risk Factor for Prolonged Recovery after Concussion?

Head (or neck) injuries can increase the severity of headaches in pre-existing migraine

Is Pre-existing Migraine a Risk Factor for Prolonged Recovery after Concussion?

Head (or neck) injuries can increase the severity of headaches in pre-existing migraine.

It is the experience of the authors that people who have migraines seem to have more severe and prolonged concussion courses after injury.


Characteristics of Posttraumatic Headache

Phenotype of Headache following TBI (N=378)

- Migraine: 38%
- Probable migraine: 25%
- Tension-type: 21%
- Cervicogenic: 10%
- Other: 6%

Posttraumatic Headache with Migraine Characteristics

Posttraumatic migraine characteristics are related to prolonged symptom recovery.\(^1\, 2\)

Athletes with posttraumatic migraine characteristics experience greater deficits on neurocognitive testing.\(^3\)

Posttraumatic Headache with Migraine Characteristics

Posttraumatic migraine characteristics are related to prolonged symptom recovery.\(^1\, 2\)

Athletes with posttraumatic migraine characteristics experience greater deficits on neurocognitive testing.\(^3\)

Should we be treating more aggressively in the acute time period post-injury?
Treatment of Headache After mTBI

“Assertive, early treatment [of headache after mTBI] may be warranted to avoid chronicity and disability.”


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Chronic Headache After Head Trauma

Trauma to the head (or neck) may trigger the migraine process in an individual who did not previously experience migraine headaches


31% of patients experiencing chronic headache after minor head trauma reported a family history of migraine

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*With directed treatment (and improvement) of underlying headache.

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## PTH ARS Question 2

In which of the following situations might an athlete be allowed to return to play?

- A. Chronic postconcussive headache with persistent concussive symptoms
- B. Acute postconcussive headache
- C. Chronic postconcussive headache with no other concussive symptoms
- D. None of the above
Thank You!

COMPREHENSIVE MIGRAINE
EDUCATION PROGRAM