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Topical Review

Part II—Management of Pediatric Post-traumatic Headaches

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ABSTRACT

BACKGROUND: Post-traumatic headache is one of the most common symptoms occurring after mild traumatic brain injury in children. **METHODS:** This is an expert opinion-based two-part review on pediatric post-traumatic headaches. In part II, we focus on the medical management of post-traumatic headaches. There are no randomized controlled trials evaluating the efficacy of therapies specifically for pediatric post-traumatic headaches. Thus, the algorithm we propose has been extrapolated from the primary headache literature and small noncontrolled trials of post-traumatic headache. **RESULTS:** Most post-traumatic headaches are migraine or tension type, and standard medications for these headache types are used. A multifaceted approach is needed to address all the possible causes of headache and any comorbid conditions that may delay recovery or alter treatment choices. For acute treatment, nonsteroidal anti-inflammatories can be used. If the headaches have migrainous features and nonsteroidal anti-inflammatories are not effective, triptans may be beneficial. Opioids are not indicated. Medication overuse should be avoided. For preventive treatments, some reports indicate that amitriptyline, gabapentin, or topiramate may be beneficial. Amitriptyline is a good choice because it can be used to treat both migraine and tension-type headaches. Nerve blocks, nutraceuticals (e.g. melatonin), and behavioral therapies may also be useful, and lifestyle factors, especially adequate sleep hygiene and strategies to cope with anxiety, should be emphasized. **CONCLUSIONS:** Improved treatment of acute post-traumatic headache may reduce the likelihood of developing chronic headaches, which can be especially problematic to effectively manage and can be functionally debilitating.

Keywords: post-traumatic headache, mild traumatic brain injury, closed head injuries, brain concussion, secondary headache disorders, pediatrics, therapeutics

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In Part 1, we described the evaluation of patients with post-traumatic headache (PTHA). While there is a paucity of studies regarding the safety of headache treatments in the injured brain, part 2 of this series will describe available evidence for abortive and prophylactic therapy for PTHA and propose an expert opinion-based algorithm for the management of pediatric PTHA.

Overall approach

An initial period of rest may be beneficial for concussion; however, the optimal amount and type of rest, as well as the optimal timing postinjury for

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initiation of low-level exercise, remain unknown.[1,2] If symptoms do not improve within 4 to 6 weeks after concussion, low-impact aerobic exercise (e.g., walking, swimming, stationary cycling) that does not exacerbate symptoms may be considered (i.e., no active return to play).[1,3,4] A study of 16 children and adolescents who were slow to recover after a concussion found that closely monitored rehabilitation in the postacute period (i.e., 1 month after injury) promoted recovery and return to their normal lifestyles.[4]

One may improve outcome after concussion by providing information in the acute period about symptoms associated with mild traumatic brain injury (mTBI) and suggested coping strategies and providing written information.[5] Treatment adherence can also be optimized by educating the patient and their family about the proper use of acute and prophylactic headache medications, establishing realistic expectations, normalizing expected recovery, emphasizing the importance of treatment and compliance, and by including the child or adolescent in the decision-making process.[6] A comprehensive approach incorporating healthy habits and identifying triggers is often beneficial.[6-8] Table 1 summarizes general principles of PTHA management.

Abortive medications

Acute medication should be made available as early as possible after the onset of headache symptoms.[7] To avoid the development of medication overuse headache (MOH), abortive medications should be used no more than 3 doses per week, and migraine specific drugs (e.g., triptans) should be used fewer than 9 times per month.[6,13,14] From the characteristics of the headache, one should make every effort to classify the PTHA because this has treatment implications, as many guidelines and opinion papers suggest treating PTHA according to the headache subtype they most resemble.[10,15,16]

Acute treatment: Outpatient

Primary headaches

The initial treatment strategy should include over-the-counter medications. Ibuprofen is safe and effective and acetaminophen is probably as effective.[17] If these are not effective, migraine specific therapy such as triptans can be considered, especially if the PTHA has features consistent with migraine.[7]

TABLE 1.
General Principles of Post-Traumatic Headache Management[6,7,9-12]

- Assess for red flags and need for imaging.
- Identify headache type(s).
- Educate the patient about headache and concussion diagnosis, treatment, and expectations.
- Establish realistic patient expectations by setting appropriate goals and discussing the expected benefits of therapy and how long it will take to achieve them.
- Encourage the patient to identify and avoid headache triggers.
- Healthy lifestyle habits:
  - Regular sleep
  - Adequate hydration
  - Well-balanced diet, without skipping meals
  - Avoidance of caffeine overconsumption
  - Stress management
- mTBI activity restrictions and recommendations:
  - No gym, sports, or other strenuous activities
  - No academic examinations, test, quizzes, projects, or oral presentations until symptoms have resolved and then increase gradually as tolerated
  - Avoid activities such as computers, video games, texting, watching television, and playing musical instruments
  - Additional recommendations for adolescents:
    - Avoid going to parties or movies in theaters
    - Avoid driving until symptoms resolve
    - No alcohol or drugs
- Empower the patients to be actively involved in their own management by tracking their own progress through the use of a headache log (record headache days, treatment, and treatment response).
- Avoid analgesic overuse: limit acute therapy to 2-3 headache days per week on a regular basis. Educate patients and families about medication overuse.
- If available, use complementary modalities: biofeedback, relaxation techniques, stress management, cognitive behavioral therapy, or coping skills training.
- Identify and treat comorbidities:
  - E.g., depression, anxiety, sleep disorders, and obsessive-compulsive disorders
- During headaches:
  - Acute medication should be made available as early as possible after onset of headache
  - Use of a proper formulation and dose based on the child's weight
  - Rest and sleep in a quiet dark room
  - Maintain hydration
- For preventive treatment:
  - Start with a low dose and increase slowly
  - Use an adequate trial of 2-3 months
  - Avoid medication interaction/contraindications
  - Consider side effects
  - Consider comorbid conditions
  - Monitor with symptom calendar or diary
  - Taper medication when headaches are well controlled (after 4-6 months)
- If symptoms persist longer than 2 weeks, consider referral to mTBI Program (Interprofessional Concussion Clinic) in your region.

Abbreviation:
mTBI = Mild traumatic brain injury