Unmet Needs in the Treatment of Adolescent Migraine

Toolkit for Healthcare Professionals

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You can watch the **Adolescent Migraine** video case in full on-demand through our learning platform, **www.IME.Healthcare.**

BURDEN OF MIGRAINE IN ADOLESCENTS

- **Headaches are a very common and disabling problem** affecting millions of children and adolescents worldwide.[1,2]
- Globally, 10% children and adolescents experience ***migraine***, and 1-2% have ***chronic migraine***.[1,2]
- Migraine is the leading cause of disability worldwide for older adolescents and young adults.[1]
- Adolescents with migraine miss more school than their peers and face **impairments in school performance, leisure/social, family relationships, and overall quality of life.**[2]
- Migraine is a **silent disease**, with no visible no outward findings, so a report of pain may be doubted, leading to shame and frustration.[1]

TOP 3 BARRIERS TO ACCESSING CARE

Consulting an HCP

Receiving a migraine diagnosis

Prescribing appropriate treatment

GENERAL TREATMENT CONSIDERATIONS

At least 2/3 of adolescents will respond to currently available therapies, and those who benefit from preventive therapy are likely to maintain better headache control into adulthood.[1]

Strategies for developing a treatment plan:[3]

- Use evidence-based preventive treatments.
- Start low and titrate.
- Reach a therapeutic dose.
- Give an adequate trial.
- Establish realistic expectations.
- Optimize agent selection.
- Maximize adherence.

Lifestyle modifications and preventive therapies

Lifestyle modifications

Consistent lifestyle habits should be discussed with all patients and their families, including lifestyle modification, identifying and addressing migraine triggers/aggravating factors, and avoidance of medication overuse.[1,4]

Preventive treatment

- **Pharmacological options** include topiramate, propranolol, or amitriptyline + CBT (remember to discuss safety profiles!).[1,4]
- **Neuromodulation devices.**[3]

Treating acute episodes

All adolescents with migraine should receive an acute treatment plan to be used at the start of an episode that includes a school note permitting them to be excused from class at symptom onset to hydrate, take an acute medication, and rest before returning to class.[1]

Acute treatment options include **NSAIDs, triptans, and/or antiemetics.**[1,4] **Neuromodulation devices** are another possible option.[3]

Opioids are *not recommended* for acute treatment of migraine in adolescents.[4]

WHICH PATIENTS CAN BENEFIT FROM TREATMENT WITH A NEUROMODULATORY DEVICE?

- **All patients with a confirmed diagnosis of migraine may be offered treatment with a neuromodulatory device**, which modulates headache pain mechanisms by stimulating the nervous system centrally or peripherally with an electric current or a magnetic field.[3]
- Three devices are currently FDA-cleared for acute and/or preventive treatment of migraine treatment in adolescents 12 years and older **(REN, nVNS, and sTMS)**.[1,3]
- All FDA-cleared devices have good safety profiles. Device-related adverse events are generally mild and transient, and related to localized reactions (e.g. warmth, pain, redness).[5-7]

Neuromodulation may be an especially important alternative for patients who:[3]

- **Prefer nonpharmacologic therapies**, and/or
- **Have failed to respond to, have contraindications to, or have poor tolerability with pharmacotherapy**, and/or
- **Have frequent migraine attacks and are at higher risk of medication-overuse headache and/or chronic migraine.**

	Remote electrical neuromodulation (Nerivio®) [5,8]	Noninvasive vagus nerve stimulation (gammaCore Sapphire™) [6,9]	Single-pulse transcranial magnetic stimulation (SAVI Dual™) [7,10]
Mechanism of action	Electrical nerve stimulation through weak electrical pulses invokes CPM to inhibit migraine pain.	Mild electrical stimulation to the vagus nerve.	Brief, noninvasive, single pulse of magnetic energy creates a brief electrical current to stop/reduce migraine.
Administration	Self-administered (arm).	Self-administered (neck).	Self-administered (head)
Acute treatment	At onset of migraine headache or aura (45 min).	2 x 2-min stimulations; repeat if needed.	3 pulses > Wait 15 min > Repeat if needed.
Preventive treatment	Every other day (45 min).	2 x 2-min stimulations BID.	2 pulses > Wait 15 min > 2 pulses, BID.
Clinical data in adolescents (12–17 years)	Evaluated in 6 clinical studies, including a **prospective, open-label study evaluating efficacy and safety in adolescents with migraine:** **Primary endpoints:** favorable safety and tolerability (*N*=45 – largest adolescent data set compared with other devices). **Secondary endpoints (efficacy):** Pain relief at 2 hours: 71% Pain-free at 2 hours: 35% Improvement in functional ability at 2 hours: 69%	Label expansion to include adolescents based on previously reported RCT data for acute and preventive treatment of migraine, and supported by a **small study in adolescents (*N*=9) with migraine with aura**, in which 46.8% of 47 treated migraine attacks were successfully treated without the use of any acute rescue medication.	**Pilot open-label study in adolescents to assess feasibility, tolerability, and patient acceptability of sTMS for acute and preventive treatment of migraine in adolescents (*N*=12):** Overall, sTMS was a feasible, well-tolerated, and acceptable nonpharmacologic preventive treatment for migraine in adolescents. **Key limitation:** preventive treatment with a 15-min delay between pulse series was challenging, especially on school days, requiring administration without the 15-minute delay.

Abbreviations: BID, twice a day; CBT, cognitive behavioral therapy; CPM, conditioned pain modulation; FDA, Food and Drug Administration; min, minute(s); NSAID, nonsteroidal anti-inflammatory drug; nVNS, noninvasive vagus nerve stimulation; RCT, randomized controlled trial; REN, remote electrical neuromodulation; sTMS, single-pulse transcranial magnetic stimulation.

References: 1) Szperka C. *Continuum (Minneap Minn)*. 2021;27(3):703-31. **2)** Gibler RC, et al. *Pediatric Health Med Ther*. 2022;13:309-23. **3)** Ailani J, et al. *Headache*. 2021;61(7):1021-39. **4)** Oskoui M, et al. *Neurology*. 2019;93(11):500-9. **5)** Theranica Bio-Electronics Ltd. Nerivio®: User manual, version 2.8. Updated Sep 2023. Accessed Dec 17, 2023. **6)** electroCore Inc. Instructions for use for gammaCore Sapphire™ SLC, 64000-00142 Rev 6. Updated 2022. Accessed Dec 17, 2023. **7)** eNeura Inc. SAVI Dual™ migraine therapy: Instructions for use – Prescriber's manual. Accessed Dec 17, 2023. **8)** Hershey AD, et al. *Headache*. 2021;61(2):310-7. **9)** Grazzi L, et al. *Neurol Sci*. 2017;38(Suppl 1):197-9. **10)** Irwin SL, et al. *Headache*. 2018;58(5):724-31.