

An Osteopathic Approach to Pediatric Headaches



AOBP with thanks to:

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Headaches in Childhood

- **Most common causes of headaches**
 - Common head and neck infections
- **Most important causes of headaches**
 - Migraine
 - Psychogenic factors or stress
 - Increased intracranial pressure
- **Uncommon causes of headaches**
 - Refractive errors
 - Strabismus
 - Sinusitis
 - Malocclusion of teeth

Migraine Headaches

- Migraines are common in the pediatric population
- Migraines affect 4% of children between 7-15 years of age
- Girls more likely to have migraines as adolescents
- Boys slightly more likely to have migraines in children <10 y/o
- More than half of children diagnosed with migraines before the 10th year of life will undergo spontaneous prolonged remission of headaches

Classification of Migraines

- **Migraine without aura**
 - Most prevalent type in childhood
 - Unilateral throbbing
- **Migraine with aura**
 - Visual aura is uncommon in childhood
 - After onset of aura=typical migraine symptoms
 - Hemiplegic and basilar migraines included
- **Childhood periodic syndromes that are common precursors to migraines**
 - Cyclic vomiting
 - Abdominal migraines
 - Benign paroxysmal vertigo

Migraine Symptoms

- Throbbing pain
- Nausea, vomiting, light-headed
- Photophobia, phonophobia
- Irritability, moodiness, hypersomnia
- Paresthesias of hands and feet
- Tightness of neck and scalp muscles.
- Migraine attacks can last as long as 1-3 hours or up to 3 days
- Physical activity aggravates the pain
- Relief of pain with sleep

Pediatric Migraines

- Migraines in children are often of shorter duration than adults
- A positive maternal family history is present in 90% of children diagnosed as migraine without aura
- Hemiplegic migraines are more common in children than adults
- Can be characterized by less pronounced symptoms
 - Vomiting
 - Abdominal pain
 - Vertigo
 - Paleness
 - Moodiness

Cause of Migraine

- Current theory is that some trigger causes enhanced neuronal firing that sends a wave of depolarization to pain sensitive blood vessels
- Neurogenic vascular inflammation causes excitation of pain sensitive receptors and the onset of pain
- Trigger can be different in each patient
- Most common precipitators of migraine in children
 - Stress
 - Fatigue
 - Anxiety

Causes of Migraine

- ◎ Some studies point to food associations with migraines
 - Nuts, chocolate, cola, citrus, cheese, yogurt, hotdogs, processed meats, MSG
 - Institute a combined food/headache diary
- ◎ Sleep disorders commonly associated with migraines

Management Guidelines for Migraine Treatment

- Reduce headache frequency, severity, duration
- Reduce reliance on acute pharmacotherapy
- Improve quality of life
- Avoid acute headache medicine escalation
- Education of patient
- Enhance patient personal control of migraine management
- Reduce headache-related distress and psychological symptoms

Non-medical Treatment of Migraines

- Re-assess school placement and academic abilities
- Eliminate any associated foods and avoid excessive hunger
- Eliminate any associated medications/drugs
 - Oral contraceptives, alcohol, cocaine
- Avoid bright lights and loud noises
- Improve sleep hygiene and avoid excessive fatigue

Medical Treatment of Migraines

○ Acute management

- Analgesia: acetaminophen, ibuprofen
- Antiemetic: dimenhydrinate, metoclopramide
- Abortive medications: sumatriptan

○ Prophylactic therapy

- Daily medications to prevent headaches: propranolol
- Consider use if more than 2-4 severe headaches per month
- Consider if school attendance is adversely affected by headaches

Evidence-based Medicine: Migraines

- 2009 retrospective chart review regarding cost of care in migraines
- Compared cost of care (including cost of medication) between an OMT clinic and an allopathic clinic
- 631 patients or 1427 patient visits for migraine included

Evidence-based Medicine: Migraines

- No difference between the 2 groups in rating of pain severity
- Average cost significantly less in OMT group (about 50% less)
 - OMT: \$195.63
 - Allopathic: \$363.84
- Cost differential attributed mostly to less medication prescribed at OMT clinic
 - OMT: 0.69 prescriptions/visit
 - Allopathic: 1.28 prescriptions/visit
- Authors concluded that the addition of OMT can lower the cost of treating migraines

Behavior Management for Migraines

- ◎ **Biofeedback**

- Useful in children older than 8 y/o

- ◎ **Self-hypnosis**

- Shown to decrease migraine frequency

- ◎ **Children have responded well to being taught imagery and can often learn to control migraine pain without use of medications**

Osteopathic Considerations in Migraine

- A percentage of patients with migraine complain of back or neck pain during or immediately before a migraine
- Attention should be given to the muscles of the neck, scalp and upper thoracics
- One of the triggers of migraine might be musculoskeletal pain and by eliminating this trigger, these migraines could be avoided

Evidence-based Medicine: Migraines

- 2010 osteopathic study of 49 patients with migraine headaches
- Myofascial exam of head and neck were performed on each patient to determine if palpation of muscle groups reproduced migraine symptoms
 - Sternocleidomastoid
 - Trapezius
 - Posterior masseter
 - Temporalis
 - Corrugator superciliosus
 - Posterior superior cervical
 - Suboccipitalis
 - Levator scapulae

Evidence-based Medicine: Migraines

- If palpation produced migraine, patient was prescribed at home physical-therapist supervised muscle stretching (PTS) of that area three times a day for 3 months
- Follow-up was at 6 weeks and 3 months
- Patients were allowed to use headache medications as necessary

Evidence-based Medicine: Migraines

- 88% of the patients had a migraine reproduced by myofascial exam
- At the end of the study, the following had statistically significant improvement in headaches
 - 64% in migraine without aura
 - 72% in chronic migraine
 - 77% in migraine with aura
- Author concluded PTS may be appropriate first-line treatment if exam indicates

OMT for Migraines

- Acute phase of migraine
 - Active, direct OMT techniques can increase blood flow to the head possibly resulting in an exacerbation of symptoms
 - Gentle, indirect techniques should be performed
 - Cervical and thoracic myofascial release
 - Sub-occipital release
- Migraine prophylaxis between attacks
 - Direct techniques can be used, such as HVLA, to prevent migraines from occurring
 - Attention to sympathetic sites of lower cervical and upper thoracic vertebrae
 - Sympathetic innervation to head and neck is T1-4
 - Vagus nerve has connections with the 1st and 2nd cervical nerves and could explain nausea and vomiting associated symptoms
 - The right and left ganglia nodosum of the vagus nerve lie in the fascial tissues just anterior to OA and AA and could explain associated abdominal complaints

Tension Headaches

- Common in pediatric patients
- Typical onset with puberty
- Most apparent during school day
- Typically coincide with stressful circumstances
- Diagnosis of exclusion
- May be seen in association with depression

Symptoms of Tension Headache

- ◉ Described as hurting or aching
- ◉ Frontal and/or occipital distribution
- ◉ Not associated with nausea, vomiting
- ◉ Not described as throbbing
- ◉ Can persist for weeks but tends to wax and wane
- ◉ Not appear in morning, but intensifies throughout the day

Osteopathic Considerations in Tension Headaches

- Stress may unconsciously produce constant, isometric contraction of muscles which could lead to headache
 - Temporalis
 - Masseter
 - Trapezius
 - Frontalis

Evidence-based Medicine: Tension Headache

- 1979 study of 22 patients diagnosed with tension-type headaches (TTH) without a history of head trauma
- Randomly assigned to one of 3 groups
 - Structural exam and 10 min. of OMT
 - Structural exam without OMT
 - Structural exam and 10 min. of supine resting
- A blinded, independent team measured EMG in Frontalis m. before and after treatment

Evidence-based Medicine: Tension Headache

- Before intervention: all 3 groups had similar EMG readings of Frontalis m.
- No change in any EMG readings after intervention
- Significant reduction in headache on an 8-point subjective pain scale after OMT over the other 2 groups
- Authors concluded results suggest that the efficacy of OMT cannot be attributed to attention-placebo effect or relaxation effects alone

OMT for Tension Headaches

- Evaluate and treat cervical vertebral segmental dysfunction, with attention to C1-2
- Evaluate and treat thoracic vertebral segmental dysfunction, with attention to T1-4
- Evaluate and treat focal and regional myofascial dysfunction
- Evaluate and treat craniosacral dysfunction

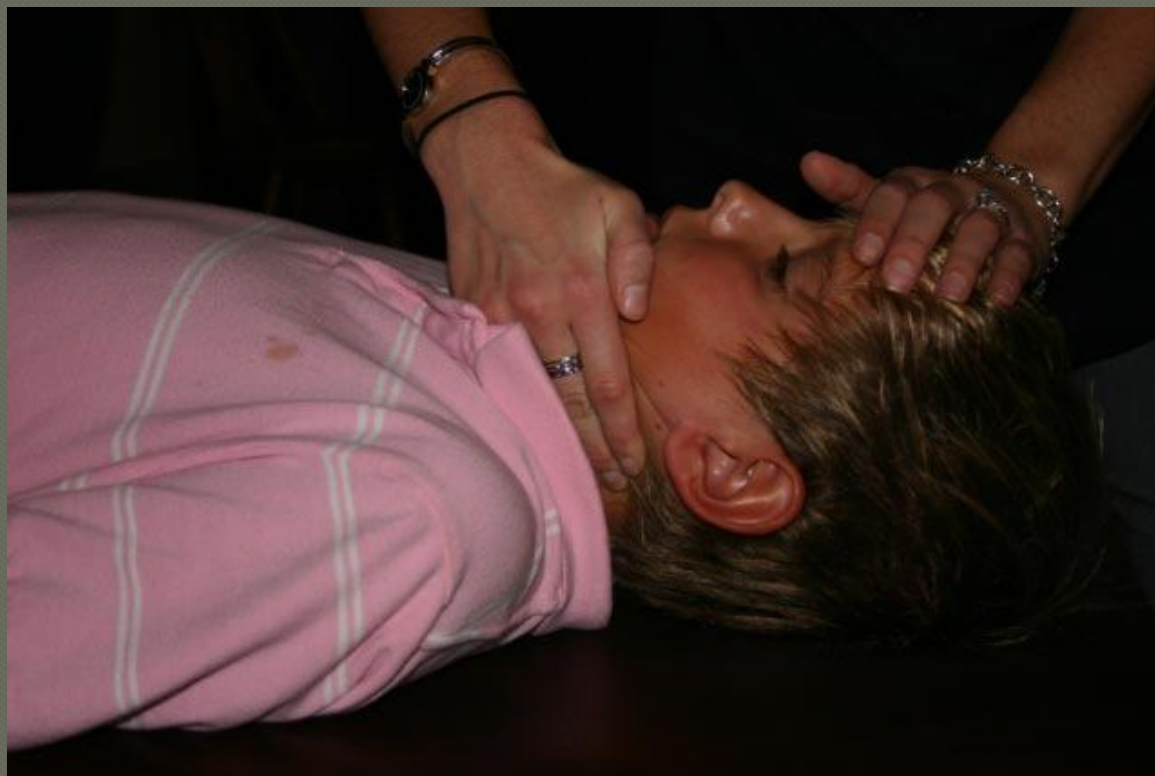
Evidence-based Medicine: Tension Headache

- 2006 randomized controlled trial of tension headache treatment to compare the effects of progressive muscular relaxation (PMR) alone and in combination with OMT
- 26 patients, aged 17 years and older
 - PMR only=12 patients
 - PMR + OMT= 14 patients

Evidence-based Medicine: Tension Headache

- OMT group had 3 weekly sessions of OMT directed to patient dysfunction but included use of:
 - Articulatory techniques
 - Functional methods
 - Muscle energy
 - Strain-counterstrain
 - Cranial techniques
- All patients reassessed at 2 weeks post-treatment by a blinded physician
- Comparable compliance between groups with at home PMR
- Significant improvement in number of headache-free days per week recorded in OMT group

Cervical Kneading



How It Is Done:

- ① 1) Patient is supine.
- ② 2) Physician stands at head of patient on opposite side to be treated
- ③ 3) Place one hand on the patient's forehead.
- ④ 4) With the other hand grasp the posterior cervical muscles and stretch by pulling anteriorly

Sub Occipital Tension Release



How It Is Done:

- ① 1) Patient is supine with physician at head of bed.
- ② 2) Place index and middle fingers in the occipital sulcus on both sides.
- ③ 3) Apply linear traction until a release is felt, about 1 minute or as long as needed to feel the release.

Cervical HVLA



How It Is Done:

- ① 1) Patient is supine with physician sitting at the head of patient.
- ② 2) Place 2nd metacarpophalangeal joint along the posteriorly rotated articular pillar.
- ③ 3) Sidebend and rotate to the point of maximum resistance at the dysfunction
- ④ 4) Apply rapid thrust in direction of facet joints, further into the barrier

Question 1

- A 12 year old presents with headaches that have been defined as migraines. Her current migraine has been persistent for 26 hours. Which of the following OMT is most appropriate at this time?
 - A. Cervical HVLA
 - B. Cervical muscle energy
 - C. Rib raising
 - D. Suboccipital release
 - E. Thoracic HVLA

Question 2

- Based on a retrospective review of migraine treatment, OMT has been shown to help by:
 - A. Decreasing the cost of care of migraines
 - B. Decreasing the frequency of migraines
 - C. Decreasing the pain severity of migraines
 - D. Increasing the frequency of office visits per migraine
 - E. Increasing the NSAID use over opiates for migraines

Question 3

- Migraines are typically associated with symptoms of nausea and vomiting. OMT directed at which of the following areas might help alleviate some of these symptoms?
 - A. C1-2
 - B. C7-T1
 - C. T4-5
 - D. T12-L1
 - E. L5-S1

Question 4

- Chronic contraction of which of the following muscles could produce a tension headache?
 - Corrugator superciliosus
 - Frontalis
 - Levator scapulae
 - Platysma
 - Sternocleidomastoid

Question 5

- A 16 year old boy presents with a headache of 1 week duration that started just before a week of exams. It gets a little better with sleep but worse again as the day progresses. OMT directed at which of the following areas would help alleviate increased sympathetic tone related to his headache?
 - A. C2-3
 - B. T 2-4
 - C. T 5-8
 - D. L1-3
 - E. L5-S2

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