Headaches - What a Pain in the Neck

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Time: 8:15 AM - 12:30 PM

Session ID & Location: 9C: MtgRm11  
CEU Eligibility: 0.4

Presented by: Graeme Keys, PT, Dip MDT

Session Description: Primary Objectives

1. To identify cervicogenic headaches from other headache sources including migraine, tension and cluster and demonstrate a strong awareness of headache types and the role of CGH and its presentations in comparison to others
2. To educate patients on the role that therapy can play in the management of headaches
3. To perform a thorough initial examination of the upper cervical spine with a focus on finding the “concordant” or “comparable” sign in relation to headache complaints using EBP where applicable
4. To learn and refine manual therapy techniques to the upper cervical spine in relation to headaches
5. Demonstrate the ability to perform the fundamental manual therapy techniques and exercise selection in the upper cervical spine

Presenter Bio(s): Graeme Keys, PT, Dip MDT graduated from the University of Ulster at Jordanstown, Northern Ireland in Physiotherapy in 1995. After working for 2 years in the UK health system he immigrated to the USA in 1997. He settled in Knoxville, TN in 2000 to work at a Spine Center of Excellence as the Director of Physiotherapy, working with Spine surgeons and Injection trained Physiatrists in the conservative and post-surgical management of spinal conditions. This became his area of special interest and extensive experience. He also worked Results Physiotherapy in the Knoxville and surrounding areas as their Director of Clinical Quality and District Clinical Quality Leader.

Graeme is a Diplomate of the Postgraduate residency program of the McKenzie Institute International (Dip. MDT) He is also a Certified Orthopaedic Manual Therapist (COMT) and a Certified Mulligan Practitioner (CMP). Graeme currently guest lectures at ETSU in their Orthopaedic Physical Therapy department, and also lectures to Physical Therapists state-wide on post-operative management of spinal conditions and integration of manual therapy approaches. He is an editor on SpineUniverse.com, both posting and reviewing articles on manual therapy and spine treatments.

As a father of 11-year-old twins, most free time is spent with the family, but Graeme has found time to enjoy immensely travelling the US, both conventionally and also on his Harley Davidson, and loves East Tennessee for some of the most breathtaking scenery to enjoy all seasons.
Headaches – What a Pain in the Neck
Pre/Post-Test

1. How many people suffer from chronic headaches?
   a. 10 million
   b. 50 million
   c. 45 million
   d. 80 million
   e. none of the above

2. Name 5 out of 10 of the criteria for differentiating between cervicogenic headaches (CGHA) and migraine/tension headaches?

3. What is the role that therapy can play in the management of headaches?

4. During a thorough initial examination of the upper cervical spine focused on finding the “concordant” or “comparable” sign in relation to headache complaints, what method(s) are used?

5. Name the 3 cervical spine assessment precautions:

6. True or False: Headaches usually respond better to sustained vs. repeated exercises.
Headaches...........What a pain in the neck....;-)

Graeme Keys PT, Dip MDT
Results Physiotherapy
Regional Education Coordinator

Outline

• intro
• classification
• cervicogenic headache
• comparison of migraine, tension, cluster and CGHA
• Therapist assessment
• Manual treatment options
• Exercise programs

Statistics......

• 45 million people suffer chronic headaches
• 1 emergency room visit every 10 seconds
• 18% of women and 8% of men suffer migraines

Classification

• International Headache society released their 3rd edition of International Classification of Headache Disorders (ICHD) in 2013
• Has almost 300 classifications identified for an ICD-9
• We will learn them all today.........
Classification

- Migraine
  - with aura
  - without aura
- Tension type headache
- Cluster Headache
- Other

Cervicogenic Headaches

- “a referred pain perceived in any part of the head caused by a primary nociceptive source in the musculoskeletal tissues innervated by cranial nerves”

Cervicogenic Headaches

- Incidence of CGH ranges in literature from 2%-18% of all headaches
- By definition this headache should be abolished following a diagnostic blockade of a cervical structure or its nerve supply

Cervicogenic Headaches (CGHA)

- CGHA can be differentiated from Migraine and Tension headache with 100% and 86% sensitivity/specificity if 7/10 CGHA criteria are present
CGHA criteria

- Symptoms of neck pain/restriction producing CGHA
- Confirmatory evidence with diagnostic blocks
- Unilaterality of head pain
- Head pain mod-severe, non-throbbing, non-lancing, varying duration and fluctuating

CGHA criteria contd

- Marginal effects with triptans
- 3:1 ratio females in Migraine
- Frequent past h/o head trauma
- Dizziness, vertigo, blurred vision
- Ipsilateral peri-ocular edema
- Photophobia, Phonophobia always in Migraine

When a headache should be a concern.....

- New onset after 40
- Sudden severe “unlike any other” (Taylor '05, Kerry '09)
- Pain associated with neuro (diplopia, dysarthria, coordination loss, confusion)
- HA assoc. with fever, nausea, vomiting, myalgia
- HA with neck stiffness esp. flexion
- Progressive worsening over days/weeks
- After head injury, with Valsalva, during pregnancy

Migraine

- Migraine is a genetic disorder - predisposed or not!
- It is a transient neurological event with neurovascular pain syndrome
- Pain referred from dura and blood vessels
- Pain associated with neurogenic inflammation
Migraine

• May have prodromal features
  • mood change
  • neck pain
  • fatigue
  • food cravings

Migraines cont’d.....

• Aura
  • visual distortions, zigzag lines, flashing lights
  • altered cognition, imbalance
  • numbness tingling
  • clumsiness

Postdromal complaints

• “Washed out” or “beat up” feeling
• Fatigue and muscle weakness
• Cloudy or feeling of “out of it”

Potential Migraine Irritants

• Neck Dysfunction
• Hormones changes
• Medications
• Exertion
• Weather changes
• Sleep Disturbances
• Allergies
• Hunger (blood sugar level changes)
• Lights
• Sounds
• Alcohol
• Food Triggers
• odors
• Stress
Food Triggers

- Aged Cheeses
- red wine/dark liquor
- artificial sweeteners
- caffeine
- chocolate
- dairy products
- Pickled foods
- Fruits
- Meats with nitrates
- MSG
- Nuts
- Onions
- Sulfites
- Yeast Products

Migraine criteria

A. At least 5 attacks fulfilling criteria B-D
B. Headache lasting 4-72 hrs
C. Headache has at least 2 of following
   1) Unilateral location
   2) Pulsating quality
   3) Moderate or severe intensity
   4) Aggravated by or causing avoidance of routine physical activity e.g. walking climbing stairs
D. During headache at least 1 of the following
   1) Nausea and/or vomiting
   2) Photophobia and Phonophobia
E. Not attributed to another disorder

Cervicogenic Migraine

Cervicogenic HA

Prevalence symptoms

Neck pain

Neck stiffness

Neck pain

Neck weakness
Tension Headaches

- differ in length of duration from migraines
  30mins - 7 days
- also differs in location, intensity, prodromal/postdromal and aura symptoms

Tension Headaches

- Headache that has at least 2 of the following characteristics
  - Pressing, tightening, (non-pulsating) quality
  - Bilateral location
  - Mild to moderate intensity (no ADL limitation)
  - Not aggravated by routine physical activity

Tension Headaches

- Requires both of the following
  - No nausea or vomiting
  - No more than one of Photophobia or Phonophobia

  Rectus Capitus Posterior Minor and Major suspected major involvement with many others

Tension Headache Treatment

- Many do well with OTC symptom management - problems can occur with rebound headaches
- preventative medications have included antidepressants and muscle relaxers
- manual physical therapy can play a large role.
- much overlap with CGHA symptoms
### Migraine v’s Tension v’s CGHA

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<td>Phonophobia</td>
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### Cluster Headaches

- Much less common than migraine or tension type headaches
- Named for the nature of occurrences
- May have many headaches daily for a period then none for months

### Cluster Headaches

- Excruciating pain nature located around one eye
- Redness, tearing and swelling around eye
- Attacks last 15 mins - 3 hours
- Often occur at the same time each day
- Can last 6-12 weeks each cluster
- More likely in men

### Cluster Headaches

- Usually good response to triptans
- 100% oxygen helpful for many
- Usual symptom management also helpful to some
- If true cluster - minimal help if any from manual therapy approach
Manually Trained Therapist assessment of Headaches

- Upper cervical spine is most considered
- passive physiological and passive accessory movements most helpful
- special tests - flexion/rotation test very helpful - research backed
- muscular palpation may prove helpful

Cervical Spine Assessment Precautions

- Several areas of concern:-
  - Vertebral Basilar Artery Insufficiency (VBI)
  - Transverse Ligament
  - Alar Ligament

VBI Testing

- Controversy over if testing is appropriate
- Cote et al (1996) found it not valid enough to detect reduced blood flow in the VA
- positive predictive value = 0%
- negative predictive value 63-97%

Transverse Ligament - Sharps Purser test

- Not without controversy either!
- Sensitivity = 69%, specificity 96%
- Other authors found no consistent level of intra-/ inter-tester reliability
Cervical Assessment

- Muscular system
- Articular
- Nervous

Cervical Musculature

Erector spinae, upper
- Extension, rotation C1–T1
- Longus capitis Flexion C1–C3
- Longus colli Flexion C2–C6
- Rectus capsitis anterior
- Flexion C1–C2
- Rectus capsitis lateral Flexion
- C1–C2
- Scalene Flexion, rotation
- C4–C8
- Semispinalis capitis
- Extension, rotation C1–T1
- Semispinalis cervicis
- Extension, rotation C1–T1
- Splenius capitis Extension,
- rotation C1–C8
- Splenius cervicis Extension,
- rotation C1–C8
- Sternocleidomastoid Flexion,
- rotation C1–C4
- Trapezius, upper Extension,
- rotation C3–C4
- Levator scapulae Elevate
- scapula C3–C5
- Rhomboideus minor
- Retraction scapula + fixation
- C4–C5

Nerve Supply

- Merger of C1, C2 and C3 spinal nerves
  with 5th Cranial nerve (Trigeminal)

- "The trigeminocervical nucleus is a region of the upper cervical spinal cord
  where sensory nerve fibers in the descending tract of the trigeminal nerve
  converge with sensory fibers from the upper cervical roots. This convergence of
  nociceptive pathways allows for the referral of pain signals from the neck to the
  trigeminal sensory receptive fields of the face and head as well as activation of
  the trigeminovascular neuroinflammatory cascade. Also relevant to this condition
  are the sensorimotor connections of the spinal accessory nerve (CN XI)
  with upper cervical nerve roots, which ultimately converge with the descending
  tract of the trigeminal nerve. These connections may be the basis for the well-
  recognized patterns of referred pain from the trapezius and sternocleidomastoid
  muscles to the face and head. ** Bondi 2005

Cervical Assessment

- Upper cervical seated PPIVM assessment
- looking for provocation of symptoms - pain
  or headache
- or looking for ROM asymmetries
Passive Accessory Intervertebral Movement - PAVIM

- by definition - a movement that occurs in the joint during normal physiological movements but cannot be produced by the patient.
- described at length by Maitland
- Use of Maitland grading necessary to identify R1 (first resistance), R2 (limit of resistance), P1 (onset of pain) and P2 (maximum tolerated pain)

Comparable Sign

- “A comparable joint or neural sign refers to a combination of pain, stiffness and/or spasm which the examiner finds on examination and considers to be comparable with the patients symptoms”
- Maitland 1991
Comparable Sign

- Abnormal in range resistance or spasm
- Must produce patient's symptoms
- Evaluation must focus on the most comparable sign

C1/2 Flexion Rotation Test (FRT)

- Hall et al (2007) demonstrated a high sensitivity 0.91 and specificity 0.90 with the FRT
- In other words, it can detect if C1/2 dysfunction is present and the cause and if it is not
- A loss of 10 degrees of movement was necessary amount to be significant
Supine Passive Physiological Intervertebral Motion (PPIVM)

- As described by Maitland, and also using coupling movements (Type II)
- Allows segmental physiological assessment
- Combination of rotation and side bend most common
- could also incorporate extension, lateral deviation, compression

Break Time!!

Assessment Lab

- Precaution tests - VBI, Sharps purser
- Seated PPIVM
- Supine PPIVM and coupling movements
- FRT - Supine
- PAVIM assessment in prone. Differentiation of C0-1, C1-2 and C2-3

Treatment options

- the following are several options for manual therapy
- self treatments are most necessary and should always be included to match when appropriate
• Thoracic Thrust - Supine, C/T junction
  • Seated C/T junction
• Cervical Manipulation - rotation/sidebend
• Mulligan C1-2 Rotation SNAG (sustained natural apophyseal glide)
• Mulligan C2-3 Rotation SNAG
• Mulligan NAG/Reverse NAG C2

• Maitland PAVIM’s C0-1, C1-2, C2/3 UPA’s
• McKenzie - Retraction in sitting
• McKenzie - Retraction Mobs in sitting/supine
Exercises

- Retraction in Sitting: usually not performed well by PT or patient!
- Simplest form of Deep Neck Flexor re-training
- Headache responds better to sustained vs repeated usually

Deep Neck Flexor Re-Training (DNF)

- DNF training: can perform Cranio-Cervical Test with a blood pressure cuff
- Alternate a simple endurance test

Deep Neck Flexor Re-Training (DNF)

- Can initiate DNF training in supine as many very weak
- Resistance bands useful
- Progression to sitting/standing/squatting useful
Self SNAG Rotation Exercise

- Shown in the research to be effective in maintaining reduction in headache over 12 months
- Difficulty with patients performing correctly
- Use smartphone camera to video correct form if possible

Postural Re-Training

- Many options possible to achieve
- Emphasis to be on less upper cervical extension and more neutral position
- Examples included in the handout

Self Traction

- Can be difficult to provide any home traction other than a machine
- This is one of the better self versions but limited if TMJ problems exist
Summary

• Headache complaints will occur today in the office
• many different classifications are available
• patterns exist to help classify main types
• medication response helps treat and classify
• common theme of neck involvement in many classifications
• Completely clearing the neck with appropriate manual therapy can significantly reduce the frequency and intensity of headaches

References

5. R. E Windsor et al., cervical spine anatomy, july 2011, medscape. Level of evidence: 5
Supine Deep Neck Flexor Training
Reps: 10  Sets: 3  Hold (sec): 2  Weekly: 5x  Daily: 2x

Setup
- Begin lying on your back with your neck relaxed and your head resting on a pillow.

Movement
- Tighten the deep muscles in your neck to lift your head upward without letting it come off the pillow. Relax, then repeat.

Tip
- Make sure to keep your shoulders relaxed and do not let your head rotate to either side during the exercise.

Quadruped Cervical Flexion and Extension
Reps: 10  Sets: 3  Hold (sec): 2  Weekly: 5x  Daily: 2x

Setup
- Begin on all fours, with your arms directly under your shoulders.

Movement
- Slowly bend your neck upward until you are looking forward, then bend it down toward your chest, and repeat.

Tip
- Make sure to keep the rest of your back straight during the exercise.

Seated Cervical Retraction
Reps: 10  Sets: 1  Hold (sec): 1  Weekly: 7x  Daily: 8x

Setup
- Begin sitting in an upright position with your feet flat on the floor.

Movement
- Gently draw your chin in, while keeping your eyes fixed on something in front of you.

Tip
- Make sure that you do not look down as you do this exercise, or bend your neck forward.

Cervical Retraction with Resistance
Reps: 10  Sets: 3  Hold (sec): 2  Weekly: 5x  Daily: 2x

Setup
- Begin sitting upright in a chair with a resistance band wrapped around your head, holding the ends in each hand.

Movement
- Bring your hands forward and at the same time pull straight backward on the resistance band with your head, tucking your chin.

Tip
- Make sure to move your head straight backward, do not let your neck bend too far or rotate to either side.

Sub-Occipital Cervical Stretch
Reps: 10  Sets: 3  Hold (sec): 5  Weekly: 3x  Daily: 1x

Setup
- Begin sitting upright in a chair. Place one hand on the back of your head and the other on your chin.

Movement
- Gently push your chin backward, stabilizing the back of your head at the same time.

Tip
- You should feel a stretch in the upper part of your neck. There should be little movement with this exercise. Make sure to maintain good posture.
Shoulder W External Rotation on Swiss Ball
Reps: 10   Sets: 3   Hold (sec): 5   Weekly: 3x   Daily: 1x

**Setup**
- Begin by sitting upright on a Swiss ball with your elbows bent 90 degrees, holding both ends of a resistance band and your fists facing inward. There should be slight tension in the band.

**Movement**
- Slowly rotate your arms outward and slightly upward so at the top of the motion the band is at the level of your chest.

**Tip**
- Make sure to avoid arching your back and maintain a gentle chin tuck throughout the exercise.

Seated Two Arm Row with Resistance
Reps: 10   Sets: 3   Hold (sec): 5   Weekly: 3x   Daily: 1x

**Setup**
- Begin by sitting upright in a chair holding resistance tubing in each hand, anchored in front of your body. Your feet and knees should be shoulder width apart.

**Movement**
- With your fists facing each other, draw your arms back until they are parallel with your trunk, and hold, before slowly returning to the start position.

**Tip**
- Make sure to maintain a gentle chin tuck during the exercise and do not let your trunk rotate.

Scaption PNF D2
Reps: 10   Sets: 3   Hold (sec): 5   Weekly: 3x   Daily: 1x

**Setup**
- Stand with an elastic band looped around the foot on the opposite side of the arm you plan to raise.

**Movement**
- Pull up on the band, lifting your arm at a 45 degree angle from your body, squeezing your shoulder blades together. Slowly lower your arm to your side and repeat.

**Tip**
- Make sure to keep your elbows straight and avoid shrugging your shoulders and overarching your low back while raising and lowering the arm.

Single Arm Shoulder Extension with Resistance
Reps: 10   Sets: 3   Hold (sec): 5   Weekly: 3x   Daily: 1x

**Setup**
- Begin in a standing position holding one end of a resistance band with your arm straight in front of your body. You should be facing the anchor point.

**Movement**
- Pull your arm down to your side against the resistance band, then return to start and repeat.

**Tip**
- Make sure to keep your elbow straight and maintain good posture during the exercise.

Prone Scapular Retraction on Swiss Ball
Reps: 10   Sets: 3   Hold (sec): 5   Weekly: 3x   Daily: 1x

**Setup**
- Begin on all fours with your trunk resting on a Swiss ball.

**Movement**
- Bending at the elbows, pull your arms upward, then lower them back to the ground and repeat.

**Tip**
- Think of squeezing your shoulder blades together as you lift your arms.
Prone Shoulder Flexion on Swiss Ball with Dumbbell
Reps: 10  Sets: 3  Hold (sec): 5  Weekly: 3x  Daily: 1x

Setup
- Begin lying with your chest resting on a swiss ball, holding a dumbbell in each hand.

Movement
- Raise both arms overhead with your elbows straight and thumbs pointing up, then lower them back down and repeat.

Tip
- Make sure to keep your back straight and do not let your shoulders shrug during the exercise.

Prone Lower Trapezius Strengthening on Swiss Ball
Reps: 10  Sets: 3  Hold (sec): 5  Weekly: 3x  Daily: 1x

Setup
- Begin lying with your chest resting on a swiss ball.

Movement
- Raise both arms diagonally out to your sides in a Y shape with your elbows straight and thumbs pointing up, then lower them back down and repeat.

Tip
- Make sure to keep your back straight and do not let your shoulders shrug during the exercise.

Prone Middle Trapezius Strengthening on Swiss Ball
Reps: 10  Sets: 3  Hold (sec): 5  Weekly: 3x  Daily: 1x

Setup
- Begin lying with your chest resting on a swiss ball.

Movement
- Raise both arms straight out to your sides with your elbows straight and thumbs pointing up, then lower them back down and repeat.

Tip
- Make sure to keep your back straight and do not let your shoulders shrug during the exercise.
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