Recent Advances in Neurology
Case Presentation

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Disclosures

• Consultant for Eli Lilly
  – Emgality (FDA approved)
  – Lasmitidan (phase 3 clinical trials)

Case #1

• 78 y/o female referred to our clinic for further management of worsening migraine

• Migraine onset 55 years old
• Denies significant headaches prior to 55
  – family hx of migraine (mother and sister)
  – +motion sickness, + cold-stimulus headaches, +prominent jet lag
History

• Onset at 55 y/o with visual aura
  – Splintered glass, evolved over 30-45 minutes
  – Nausea afterwards, no pain
  – Occurred 1-2 x/ year

• Worsening at age 74
  – Occurred 2 days after PSG titration study
  – Initially dull facial pain, radiated into her neck/chest, lasted 3-4 days, feeling of “unwell” and nausea

History

• Stopped wearing CPAP, headaches persisted
• Gradually increased in frequency
  – Daily with increases 18 days/month

History

• Pain primarily located in face, neck, bifrontal, biparietal
  – crushing, pressure, squeezing, tightening
  – N/V, fatigue, mild photophobia
  – Worsened with movement or exertion
Past Medical History

• HTN- controlled
• OSA- AHI 6.6
• Sjogrens Disease
• Irritable Bowel Syndrome
• Subacute cutaneous lupus erythematosus, lichen sclerosis- biopsy proven on clobetasol
• DMII- controlled
• Hypothyroid
• Depression/anxiety- occasionally sees a therapist
• GERD

Current Medications

• Advil 400mg - taking daily
• ondansetron 8mg prn
• Benadryl for headaches prn
• Zolpidem 10mg qhs
• Aspirin 81mg
• Losartan 50mg
• Diltiazem 260mg
• Levothyroxine 75mcg
• Lansoprazole 30mg
• januvia
• combivent 20mcg: only uses if goes to cold climate
• Clobetasol

Prior Medication Trials

• Prior Abortive Treatments:
  (had been using one of below daily)
  – Sumatriptan- would help temporarily, but pain would recur at 24 hours
  – Rizatriptan

• Prior Preventive Treatments:
  – Nortriptyline
  – Zoloft
  – Gabapentin

• Prior non-pharmacological and procedural trials:
  – Occipital nerve blocks - no relief
  – Botox - made headaches worse
  – CBD 8:1 - ineffective
ROS

- Shortness of breath with exertion
- GERD
- Joint pain
- Low back pain

Diagnostics

- MRI brain w/o contrast 9/2017
  - Mild to moderate chronic deep white matter microvascular ischemic disease unchanged from prior comparison exam in November 2016. Otherwise normal MRI brain w/o contrast

Initial Assessment/Plan

- Chronic Migraine
- Migraine with aura
- Medication overuse headache

1. Limit ibuprofen to no more than 10 days/month
2. For further prevention start memantine vs. switching losartan to candesartan
3. Follow up with cardiologist regarding shortness of breath
Follow Up

- Saw cardiology
- Cardiac stress test (limited left arm pain)
- Nuclear medicine cardiac scan
- Found to have 2 vessel disease (70% LAD, 90% right coronary), s/p cardiac cath with 3 stents

Follow Up

- Headaches resolved after stenting

Cardiac Cephalalgia

- Lipton et al. first described 1997
- ICHD-3 10.6 description:
  - Migraine-like headache, usually but not always aggravated by exercise, occurring during an episode of myocardial ischaemia. It is relieved by nitroglycerine

Lipton RB et al. Neurology 1997; 49:813-6
Cardiac Cephalalgia

- Diagnostic criteria:
  A. Any headache fulfilling criterion C
  B. Acute myocardial ischaemia has been demonstrated
  C. Evidence of causation demonstrated by at least two of the following:
     1. Headache has developed in temporal relation to the onset of acute myocardial ischaemia
     2. Either or both of the following:
        1. a) Headache has significantly worsened in parallel with worsening of the myocardial ischaemia
        2. b) Headache has significantly improved or resolved in parallel with improvement in or resolution of the myocardial ischaemia
     3. Headache has at least two of the following four characteristics:
        1. a) Moderate to severe intensity
        2. b) Accompanied by nausea
        3. c) Not accompanied by photophobia or phonophobia
        4. d) Aggravated by exertion
  D. Not better accounted for by another ICHD-3 diagnosis.

- Rare headache disorder, considered a form of atypical angina

- Pathophysiology
  - Referred pain to head from vagal afferents
  - Transient rise in ICP secondary to decreased cerebral venous drainage from reduced cardiac output
  - Proinflammatory mediators released during cardiac ischemia leads to vasodilation of cerebral vessels

Lazari J et al. Pract Neurol 2018

Question

- Triptans are contraindicated in patients with risk factors for coronary artery disease?
  A. True
  B. False
Question

• Triptans are contraindicated in patients with risk factors for coronary artery disease?
  A. True
  B. False

Acute treatment options in CAD patients

• Consensus is that triptans should be avoided in patients with significant coronary artery disease
• Risk factors for arterial disease
  – Poorly controlled HTN, HLP, DM, premature CAD family hx (men <55, women <65), postmenopausal women
  • 1 risk factor: EKG suggested
  • > 1 risk further work-up suggested such as stress test recommended

Dodick et al. Headache. 2004
44(5): 414-25

Acute treatment options in CAD patients

• Acetaminophen -level A evidence
• Antiemetics (metoclopramide, prochlorperazine, promethazine)- level B evidence
• Butalbital/acetaminophen/caffeine- level C evidence
• Hydroxyzine (recent MI relative contraindication, prolonged QTc?)
Acute treatment options in CAD patients

- Cefaly device
- Gammacore (non-invasive vagus nerve stimulator)
  - Carotid atherosclerosis, clinically significant hypertension, hypotension, bradycardia or tachycardia contraindications
- Lasmitidan (5HT1-F)

Acute treatment options in CAD patients

- Prevention
- Prevention
- Prevention!

Question

- Arterial disease is listed as a contraindication for novel CGRP monoclonal antibodies
  A. True
  B. False
Question

- Arterial disease is listed as a contraindication for novel CGRP monoclonal antibodies
  A. True
  B. False

However....

Organ Systems Where CGRP and Receptor is Present:


Case #2

90 y/o female referred to our clinic for further management of new onset positional headache

- Began 5 months prior, no clear precipitant
- Gradual progression to current frequency of daily
- Located in bilateral occipital (left > right)
- Sharp, shooting, radiates to bilateral parietal
- Duration is minutes to hours or until she can lay down (pain would dissipate within 5 minutes)
History continued

- Triggers include cooking, being active
- Associated with mild lightheadedness, but denies migrainous features of photophobia, phonophobia, nausea
- Denies prior significant headache history

Past Medical History

- Arthritis
- Atrial fibrillation- on apixiban
- CHF- s/p pacemaker
- HTN
- Hearing loss
- cervicalgia

Current Medications

- Lisinopril 12.5mg
- Hydralazine 25mg
- Carvedilol 25mg
- eliquis 5mg
- Atorvastatin 10mg
- Amlodipine 5mg
- Potassium
- Furosemide 20mg
- Calcium
- Vitamin
Prior Medication Trials

- Prior Abortive Treatments:
  - Tylenol - doesn't help
  - celebrex - doesn't help

- Prior Preventive Treatments:
  - None

- Prior non-pharmacological and procedural trials:
  - Acupuncture - didn't help much

Diagnostics

- CT brain 5/17/17 - no intracranial mass, no hemorrhage, no midline shift or herniation. 0.9x0.14 low density mass in right sphenoid sinus, may represent a mucous retention cyst or polyp

- Prior to referral spontaneous CSF hypotension was the working diagnosis. However patient could not get an MRI brain given her pacemaker

- 2 non targeted blood patches
  - No improvement

Question

- What percentage of patients with CSF hypotension have a normal MRI brain?
  a) 5%
  b) 10%
  c) 20%
  d) 40%
Question

• What percentage of patients with CSF hypotension had a normal MRI brain?
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  b) 10%
  c) 20%
  d) 40%

Back to our case...

• Video of exam

Diagnostics

• CT cervical spine images
Diagnostics

- CT cervical spine 5/17/17 - multilevel moderate degenerative changes. Most significant neural foraminal stenosis on the left at C3-C4 and C5-6, and on the right at C6-C7. Notable changes with erosions at the C1-C2 lateral masses on the right the adjacent base of the odontoid. Likely secondary to pannus.

Assessment/Plan

- Cervicogenic Headache
- Occipital neuralgia

1. Neck physical therapy
2. Start gabapentin
3. Greater and lesser occipital nerve blocks

Follow Up

- Headache resolved
ICHD-3 11.2.1 Cervicogenic Headache

Description:
- Headache caused by a disorder of the cervical spine and its component bony, disc and/or soft tissue elements, usually but not invariably accompanied by neck pain.

Diagnostic criteria:
A. Any headache fulfilling criterion C.
B. Clinical and/or imaging evidence of a disorder or lesion within the cervical spine or soft tissues of the neck, known to be able to cause headache.
C. Evidence of causation demonstrated by at least two of the following:
   1. Headache has developed in temporal relation to the onset of the cervical disorder or appearance of the lesion.
   2. Headache has significantly improved or resolved in parallel with improvement in or resolution of the cervical disorder or lesion.
   3. Cervical range of motion is reduced and headache is made significantly worse by provocative maneuvers.
   4. Headache is abolished following diagnostic blockade of a cervical structure or its nerve supply.
D. Not better accounted for by another ICHD-3 diagnosis.

Bogduk et al. Lancet Neurol 2009: 8: 959-68
Cervicogenic Headache

- In the general population 4.1%
- As high as 17.5% amongst patients with severe headache

- Most reliable features
  - Pain that originates in neck and radiates to frontotemporal
  - Pain that radiates to ipsilateral shoulder/arm
  - Provocation of pain by neck movement

Bogduk et al. Lancet Neurol 2009: 8: 959-68

Treatment Options

- Greater occipital nerve blocks
- Cervical nerve blockades
- Facet joint injections
- Muscle relaxants
- Neuropathic pain medication
  - Tricyclic antidepressants (doxepin), gabapentin
- Physical therapy (gentle cervical traction)
- Complementary interventions such
  - Acupuncture, biofeedback and relaxation techniques, CBT

Thank You

- UCSF Headache Center Referrals:
  - Intractable migraine, cluster headaches, post-traumatic headaches and other unusual or difficult headache disorders
  - Outpatient treatment
  - Nerve blocks
  - Neurostimulation
  - Telemedicine
  - Research
  - Inpatient treatment