NEUROMUSCULAR DISORDERS IN PRIMARY CARE

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NEUROMUSCULAR DISORDERS

Peripheral Nervous System
• Intricate connection of nerves that allow signals to pass to and from the central nervous system (brain and spinal cord).

Peripheral nerves
• Motor
• Sensory
• Autonomic

Peripheral nerves
• Motor-efferent
• Upper
• Lower
• Sensory
• Autonomic

Peripheral nerves
• Motor
• Sensory-afferent
• Autonomic

Peripheral nerves
• Motor
• Sensory
• Autonomic-smooth muscles and glands
NEUROMUSCULAR DISORDERS: THE HPI

KEY: A GOOD HISTORY AND EXAM!!!

• Timeline:
  - Acute (<4 weeks)**
  - Subacute (4-8 weeks)
  - Chronic (>8 weeks)
  - Sudden vs. insidious

PERIPHERAL NEUROPATHY (PN)

So why do I care?
• 2.4% of the general population have neuropathy
• 8% of people >55 y/o

Diabetes
• 30.3 million people have diabetes mellitus (DM) in the US
• 13% of Kentuckians have DM
• 1:4 people don’t even know they have DM
• At time of DM diagnosis, 8% of people already have PN
• Neuropathy occurs more often in patients with IGT compared to NGT controls (~ twice the %)

PCP BASIC WORK UP:
SENSORY

BASIC WORK UP TO BE DONE BY PRIMARY CARE
1. HPI
2. EXAM
3. LABS:
  • CMP
  • A1C (if indicated)
  • CBC
  • SED RATE/CRP
  • B12/FOLATE
4. REFER TO NEUROLOGY FOR CONSULT OR EMG

PATTERN RECOGNITION:
SENSORY

• Characterization of sensory disturbance

  • Pins and Needles
  • Numbness/Tingling
  • Loss of Balance

  • Pain Feet/Hands
  • Burning Sensation
  • Can’t Feel The Ground

PERIPHERAL NEUROPATHY (PN)

• 1) Symmetric proximal and distal weakness with sensory loss
  • THINK GBS/CIDP
• 2) Symmetric distal sensory loss with or without distal weakness
• 3) Asymmetric distal weakness with sensory loss
• 4) Asymmetric proximal and distal weakness with sensory loss
• 5) Asymmetric distal weakness without sensory loss
• 6) Symmetric sensory loss and distal areflexia with upper motor neuron findings
• 7) Symmetric weakness without sensory loss
• 8) Focal midline proximal symmetric weakness
• 9) Asymmetric proprioceptive sensory loss without weakness
• 10) Autonomic Symptoms and Signs

Barohn, R. J., & Amato, A. A. (2013)
PERIPHERAL NEUROPATHY (PN)

1) Symmetric proximal and distal weakness with sensory loss
2) Symmetric distal sensory loss with or without distal weakness
   - Cryptogenic (>30% of all PN)
   - THINK DIABETES OR GLUCOSE INTOLERANCE
   - Nutritional deficiencies
   - Sjögren’s
   - Hereditary- CMT

PERIPHERAL NEUROPATHY (PN)

- 1) Symmetric proximal and distal weakness with sensory loss
- 2) Symmetric distal sensory loss with or without distal weakness
- 3) Asymmetric distal weakness with sensory loss
- Mononeuropathy
- Radiculopathy
- Multiple nerves
- Vasculitis
- HNPP
- Infectious

PERIPHERAL NEUROPATHY (PN)

- 1) Symmetric proximal and distal weakness with sensory loss
- 2) Symmetric distal sensory loss with or without distal weakness
- 3) Asymmetric distal weakness with sensory loss
- 4) Asymmetric proximal and distal weakness with sensory loss
- 5) Asymmetric distal weakness without sensory loss
- 6) Symmetric sensory loss and upper motor neuron findings
- THINK MYELONEUROPATHY
  - B12
  - Copper
  - End stage liver disease
  - Vitamin E
  - Cervical spondylosis

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PERIPHERAL NEUROPATHY (PN): SFN

SMALL FIBER NEUROPATHY (SFN)
- Often follow same pattern as large fiber neuropathy (distal/symmetric)
- Often idiopathic, but can also be seen with:
  - Diabetes
  - Amyloidosis
  - Sjögren’s
  - Hereditary sensory and autonomic neuropathies
  - Acute/inflammatory
  - “Mononeuropathy”
  - HJV
- EXAM: normal muscle strength, normal proprioception and vibration, and typically normal DTRs (or brisk)
- EMG/NCV: NORMAL
- SKIN BIOPSY:
PERIPHERAL NEUROPATHY (PN): SNF

SKIN BIOPSY

PERIPHERAL NEUROPATHY (PN): TX

GABAPENTIN (Neurontin) C IV
- 300 mg PO TID
- 1st line for diabetic neuropathy
- Also helps with cramping and sleep
- Titrate patients by 300 mg every 3-5 days
- Taper similarly
- Benefits: sleep and cramping
- Side effects: drowsiness, dizziness, edema
- Contraindications: abrupt withdrawal, caution with other CNS depressants

PREGABALIN (Lyrica) C IV
- 50 mg PO TID
- Try AFTER failed on high dose gabapentin
- Titrate and taper slowly
- Side effects: drowsiness, dizziness, memory loss, edema
- Contraindications: abrupt withdrawal, caution with other CNS depressants

NORTRIPTYLINE
- Start 25 mg PO QHS
- Increase by 25 mg until desired effect or side effects
- Titrates and taper slowly
- Benefits: helps with sleep, urinary frequency, and diarrhea
- Side effects: drowsiness, dizziness, urinary retention, constipation, serotonin syndrome
- Contraindications: MI acute recovery, avoid abrupt withdrawal
- Black Box: increased suicidality

DULOXETINE (Cymbalta)
- 30 mg PO daily x 1 week, then increase to 60 mg PO daily
- 1st line for chemotherapy induced neuropathy
- Great adjunct with gabapentin if patient has depression
- Side effects: insomnia, drowsiness, stomach upset, serotonin syndrome
- Contraindications: CrCl <30, ETOH abuse, hepatic impairment
- Black Box: increased risk for suicidality

PERIPHERAL NEUROPATHY (PN): TX

2ND LINE
VENLAFAXINE
CARBAMAZEPINE
TOPIRAMATE

3RD LINE
BUPROPION
LEVETRIACETAM
PCP BASIC WORK UP: SENSORY SX

BASIC WORK UP TO BE DONE BY PRIMARY CARE
1. HPI
2. EXAM
3. LABS:
   • CMP
   • GTT/A1C (if indicated)
   • CBC
   • SED RATE/CRP
   • B12/FOLATE
4. REFER TO NEUROLOGY FOR CONSULT OR EMG

MUSCLE WEAKNESS

Ask similar HPI questions as neuropathy
- Time frame- when did it start and how fast is it progressing?
- Precipitating factors
- Family and social history
- Medication HX (STATINS!)
- Characterization and distribution of weakness
  • Episodic vs. focal vs. multifocal
  • Proximal vs. distal
  • Symmetric
  • Fatigue vs. actual weakness

MUSCLE WEAKNESS

• Associated symptoms
  • Pain- is this antalgic weakness?
  • Atrophy
  • Shortness of breath
  • Muscle cramping/myalgia
  • Skin changes
  • Fasciculations
  • UMN signs
  • Endocrinopathies

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MUSCLE WEAKNESS

• Fasciculation
  • Involuntary contraction of muscle fibers
    - Serial or random?
    - Location?
    - In the setting of pain, weakness, neuropathy, atrophy?
    - Motor Neuron Disease (ALS)
    - Neuropathy
    - Cramp-fasciculation syndrome
    - Pyridostigmine (Mestinon)
    - Radiculopathy

MUSCLE WEAKNESS

Download the add-in.
Start the presentation.
MUSCLE WEAKNESS

- Associated symptoms
  - Pain-antalgic
  - Atrophy
  - Shortness of breath
  - Muscle cramping/myalgia
  - Skin changes
  - Fasciculations
  - UMN signs
  - Endocrinopathies

MUSCLE WEAKNESS

- Pattern of weakness
  - Proximal - seen most in hereditary and acquired myopathies
  - Distal - usually neuropathy (KEY: GOOD EXAM!)
  - Proximal arm/distal leg
  - Distal arm/proximal leg
  - Ptosis with/without ophthalmoplegia
  - Prominent neck extendors
  - Bulbar
  - Episodic pain, weakness, and myoglobinuria
  - Episodic weakness unrelated to exercise
  - Stiffness and inability to relax

MUSCLE WEAKNESS

- EXAM
  - Don’t forget: Facial and Neck strength
    - Puff out cheeks
    - Rub tongue along teeth
    - Sustained upward gaze

MUSCLE WEAKNESS

Pattern of weakness
- Proximal
- Distal
- Proximal arm/distal leg
- Distal arm/Proximal leg
- Ptosis with/without ophthalmoplegia
- Prominent neck extensors
- Bulbar
- Episodic pain, weakness, and myoglobinuria
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MUSCLE WEAKNESS

BASIC WORK UP TO BE DONE BY PRIMARY CARE
1. HPI
2. EXAM
3. LABS:
   - CMP
   - CPK: does not always imply primary muscle issue!
   - 2HR-GTT
   - A1C (if indicated)
   - CBC
   - SER RATE/CRP
   - ANA
   - B12/FOLATE
   - TSH
   - Magnesium
4. REFER TO NEUROLOGY FOR CONSULT OR EMG

MUSCLE WEAKNESS: TX

- TREAT THE UNDERLYING PROBLEM
  - Address the pain
    - Non-pharmacologic treatments
      - Physical therapy
      - Massage
      - Acupuncture
      - Pickle juice, ACV, mustard
    - Compounded creams
      - Gabapentin (cramping, especially of neuropathy)
    - Muscle relaxers
MUSCLE CRAMPING: TX
- CYCLOBENZAPRINE, TIZANIDINE, BACLOFEN
  - Start low and slow
  - Never stop abruptly
- SIDE EFFECTS: dizziness, drowsiness, urinary retention, constipation, blurred vision, MUSCLE WEAKNESS
  - Cyclobenzaprine should avoid with cardiac arrhythmias

NEUROMUSCULAR DISORDERS
When Should I refer a patient?
- Acute of subacute onset
- Rapidly progressive
- Severe, functionally limiting
- Length independent
- Multifocal
- Motor predominant
- Associated with SEVERE dysautonomia

NEUROMUSCULAR DISORDERS: NEURO CONSULT
So what else do we do?
- FOCUSED NEURO EXAM
- EXTENSIVE LAB WORK-UP
- SKIN BIOPSY: for SFPN only if NCV is normal
- RECOMMEND MUSCLE OR NERVE BIOPSIES
- We refer to neurosurgery for the actual surgery
- PROVIDE TREATMENT RECOMMENDATIONS
- REFER TO OTHER SPECIALITIES
  - Pain Management
  - Rheumatology
  - Neurosurgery
  - Therapy: Physical, Occupational, Speech, and Psychological
  - Genetic Counseling

NEUROMUSCULAR DISORDERS: NEURO CONSULT
LAB WORK-UP

NEUROMUSCULAR DISORDERS
ELECTRODIAGNOSTIC TESTING
Nerve Conduction Velocities
Electromyography
REFERENCES


