Neuropathy and Neuropathic pain

Objectives

- Differentiate the terms "neuropathy" and "neuropathic pain."
- Participants will be able to explain the signs and symptoms of neuropathy.
- Participants will be able to identify neuropathic components of pain.
- Participants will be able to formulate a treatment plan for a patient with neuropathic pain using an evidence-based approach and current guidelines from the AAN.

Terminology

- **Neuropathy**: damage to nerve
- **Neuropathic pain, neuralgia, or neuralgiform pain**: pain due to the above

Types of Neuropathy

- Peripheral neuropathy
- Cranial neuropathy
- Autonomic neuropathy
- Motor neuropathy
- Brachial and lumbar plexopathies
- Acquired immune neuropathies
- Hereditary neuropathies
- Paraneoplastic neuropathies

Characterization

- Symptoms
  - Motor
  - Sensory
  - Autonomic
  - Distribution
- Distal symmetric polyneuropathy
- Mononeuropathy
- Radiculopathy
- Plexopathy

- Timing/progression
  - Acute
  - Sub-acute
  - Chronic (most)
Characterization

- Etiology
  - Reversible vs. non-reversible
  - Highest yield
    - B12
    - Thyroid
    - Malignancies (multiple myeloma, hypergammaglobulinemia)
    - Diabetes
  - Others include: Toxic, medications, infectious, nutritional deficiency, hereditary, autoimmune, amyloidosis, compression
- Pathology

Symptoms

- Sensory changes
  - Type depends on fibers involved
  - Numbness
  - Tingling
  - Weakness
  - Balance changes

Symptoms

- Pain
  - Burning
  - Lancinating
  - Electric
  - Raw
  - Shooting
  - Deep, dull, aching

Symptoms

- Autonomic
  - Labile blood pressure
  - Sweating changes
  - Gastroparesis
  - Erectile dysfunction

Signs

- Allodynia
- Hyperalgesia
- Balance difficulty
- Hyporeflexia

Signs

- Skin changes
  - Hair loss
  - Erythema
  - Shiny/smooth
  - Muscle wasting
  - Intrinsic hand muscles
  - Feet (extensor digitorum brevis)
  - Myotome/individual muscles
Signs
- Foot deformities
  - hammer-toes
  - high arches

Neuropathic Pain

Examples
- Distal Polyneuropathy
- Post-herpetic neuralgia
- Trigeminal neuralgia
- Central/Thalamic pain syndrome
- Radicular/Plexus pain
- Carpal tunnel syndrome and other compressive neuropathies

Pathophysiology
- It's complicated...

Pathophysiology
- Peripheral mechanisms
  - Ectopic neuronal activity due to dysregulation of sodium channels
  - Upregulation of receptors on remaining nociceptive endings (TRPV1 -- Capsaicin)
Pathophysiology
- Central mechanisms
  - Changes in modulation
  - Neural rearrangement resulting in pathologic activation of central nociceptive neurons
  - Activation of NMDA receptors

Management of Neuropathic Pain
- AAN guideline for the management of painful diabetic neuropathy
- Disclaimer:
  - Little evidence for chronic benefit due to short trials
  - Placebo effect accounts for up to 50%
  - Cost can be high for small benefits
  - Side effects can be intolerable

Anticonvulsants
- Pregabalin (300-600 mg/day)
  - No generic available ($$$)
- Gabapentin (900-3600 mg/day)
  - Bioavailability
  - Renally adjust
- Sodium valproate (500-1200 mg/day)
  - Birth defects

Antidepressants
- Amitriptyline (25-100 mg/day)
- Venlafaxine (75-225 mg/day)
- Duloxetine (60-120 mg/day)

Opioids
- Dextromethorphan
- Morphine
- Tramadol
- Oxycodone
- Methadone?

Others
- Capsaicin cream
- Isosorbide dinitrate spray
- Transcutaneous electrical nerve stimulation
Condition Specific treatments
- Trigeminal neuralgia
- Carbamazepine
- Post herpetic neuralgia
- Topical lidocaine cream or gel

Additional points
- Falls
- Balance
- Autonomic dysfunction
- Home modifications
- Wounds
- Consider neuropathic effects on gut motility when assessing nausea/vomiting

Final thoughts

Citations