Multiple Sclerosis

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Disclosures
• None

Objectives
• Identify diagnostic criteria for multiple sclerosis
• Describe what can be done in a primary care setting while waiting for a patient to be seen in the neurology clinic
• Describe treatment strategies for managing multiple sclerosis

Epidemiology
• ~350,000 people in the US (updated prevalence data coming soon)
• Leading cause of early disability
• Predominantly female (2-3:1)
• Rare before ages 10 and after 50
• Incidence with altitude
• Theories of infection or vitamin D
• Genetic component

Multiple Sclerosis
Pathophysiology
• Immune mediated inflammatory demyelinating process
  • Damage to myelin sheath of neurons
• T (thymus) cells = cell-mediated immunity
• B (bone marrow) cells = humoral immunity (antibodies)
• Discrete areas of inflammatory demyelination
• Demyelination and axonal loss leads to loss of saltatory conduction
• Evidence suggests that axonal loss is the major cause of irreversible disability

Multiple sclerosis
Normal Brain MRI
Multiple Sclerosis
Brain MRI Concerning for MS

Multiple Sclerosis
Dawson Fingers

Multiple Sclerosis
Cervical Spine MRI Concerning for MS

Multiple Sclerosis
HPI

- Consistent with a demyelinating event
  - Acute to subacute
  - Symptom progresses over 24 hours
  - Remains persistent for 24-72 hours
  - Requires days, weeks, or months for improvement

- Optic neuritis, diplopia, ophthalmoplegia, vertigo, weakness, parasthesia, Lhermitte's

Multiple Sclerosis
Diagnostic Evaluation

- History and exam are key
- Serum labs
  - CBC, CMP, TSH, vitamin D, B12, CRP, ESR, ANA, SSA, and SSb
- MRI of the brain and cervical spine with and without contrast
- Refer to neurology/MS specialist

Multiple Sclerosis
Making the Diagnosis and Next Steps

- Detailed history including
- Review imaging and consider thoracic spine imaging if indicated
- Lumbar puncture with CSF evaluation
- Testing for autoimmune, inflammatory, metabolic, vascular, neoplastic, or infectious causes
- Risk stratification
- Discuss treatment options
- Ongoing clinical and radiographic monitoring
- Symptom management
Multiple Sclerosis

Goals of Treatment

- Relapse rate
- Accumulation of disability
- Brain atrophy

Disease Modifying Therapy

- 1993: Interferon β-1b 250µg SC QOD (Betaseron)
- 1995: Interferon β-1a 30µg IM QW (Avonex)
- 1997: Glatiramer Acetate SQ daily (Copaxone)
- 2000: Mitoxantrone IV (Novantrone)
- 2002: Interferon β-1a 44µg SC TIW (Rebif)
- 2004/06: natalizumab (Tysabri)
- 2012: fingolimod (Gilenya)
- 2013: teriflunomide (Aubagio)
- 2013: dimethyl fumarate (Tecfidera)
- 2014: Peginterferon β-1a 125 µg every 2 weeks (Plegridy)
- 2015: alemtuzumab (Lemtrada)
- 2016: daclizumab (Zinbryta)
- 2017: ocrelizumab (Ocrevus)

Role of Primary Care

- Comorbidity management
- Preventative services
- Symptom management
- Psychosocial support

That’s all, folks!