Stroke And Multiple Sclerosis

2013 ACOI Internal Medicine Review Course
Scott Spradlin D.O. FACOI
Stroke and Multiple Sclerosis

- Stroke
  - 3rd Leading cause of Death
  - Acute brain injury due to a vascular cause
  - Sudden onset
  - Persist at least 24 hours
  - Neurological deficit
- TIA
  - Neurological deficits lasting less than 24 hours
Stroke and Multiple Sclerosis

• **Types of Stroke**
  - **Ischemic** - most common >70%
    - Thrombotic
      - Atherosclerosis
    - Embolic
      - Emboli form the Heart or Vessels
  - **Hemorrhagic**
    - Intracerebral
      - Hypertension or Amyloid Angiopathy
    - Subarachnoid
      - Berry Aneurysms
Stroke and Multiple Sclerosis
Stroke and Multiple Sclerosis

• **Thrombotic Strokes**
  - Atherosclerosis
    - Internal Carotid
    - Middle Cerebral
    - Vertebrobasilar
  - Symptoms
    - Slow stepwise progression of symptoms
    - Usually preceded by TIA’s
• **Other Causes**
  - Lupus anticoagulant
  - Polycythemia
  - Syphilis
  - Thrombocytosis
  - Dissecting Aortic Aneurysm
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• Embolic Stroke
  • Not usually preceded by TIA
• Emboli
  • Heart
  • Large Blood vessel
  • Usually effects middle>posterior>anterior cerebral
• Symptoms
  • Neurodeficits worst at onset
  • Weakness is greater in distal extremities
Stroke and Multiple Sclerosis

• Stroke Symptoms By Region
  • Middle cerebral
  • Anterior cerebral
  • Posterior cerebral
  • Single Hemisphere
  • Vertebrobasilar
  • Lateral Medullary syndrome
  • Lacunar-small vessel
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- **Middle Cerebral Artery Occlusion**
  - Contralateral hemiplegia
  - Contralateral hemianesthesia
  - Homonymous hemianopsia
  - Impaired conjugate gaze in opposite direction
  - Impaired spatial- nondominant
  - Impaired language-dominant
  - If lesion high- loss face/upper ext
  - If it is in the main trunk- same throughout
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- Anterior Cerebral Artery Occlusion
  - Most affected in distal contralateral leg
  - Urinary incontinence
  - Gait abnormalities
  - If includes corpus callosum the patient will have tactile anomia (cannot name what they touch)
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- Posterior Cerebral Artery Occlusion
  - Contralateral homonymous hemianopsia
  - Usually upper quadrantanopsia
  - Mild contralateral hemiplegia/anesthesia
  - Color anomia = corpus callosum damage
  - Memory loss
  - If occlusion bilateral memory will be severe/persistent
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- Single Hemisphere injury
  - Does not affect paraspinal muscles
  - Does not affect pharynx
  - Does not affect jaw
  - Does not affect the forehead

- If any or all of the above are affected think:
  - Bilateral hemispheric infarct
  - Brainstem infarct
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- Vertebrobasilar Artery Occlusion
  - Associated with brain stem strokes
  - Bilateral extremity motor/sensory dysfunction
  - Quadraplegia in severe cases
  - Crossed motor and sensory deficits
  - Horner syndrome
  - Cerebellar signs/stupor/coma
  - Cranial nerve dysfunction
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• Lateral Medullary Syndrome
  • Also called Wallenberg Syndrome
  • Nausea
  • Vomiting
  • Nystagmus
  • Ipsilateral Horner Syndrome
  • Ipsilateral palate and vocal cord weakness
  • Ipsilateral face hemianesthesia
  • Contralateral body hemianesthesia
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- Lacunar Strokes
  - Due to hypertension
  - Occlusion of very small arterioles
  - Over time they form cysts in the brain
  - Pure hemiplegia
  - Pure hemisensory
  - Multiple bilateral frontal lobe “lacunes” can cause pseudobulbar palsy
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- **Work up:**
  - History
  - Computerized Tomography head
  - CBC with platelets
  - Electrolytes, Glucose, Bun, Cr
  - Coagulation profile
  - EKG
  - Trans-thoracic Echocardiogram
  - Carotid Ultrasound/Trans-cranial Doppler
  - MRI if suggested brainstem
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- Ischemic Stroke Treatment
  - Alteplase
    - >18 yrs old with an ischemic stroke Dx
    - Onset time – 3 hours
  - Oxygen
  - Treat BP-gradually
- Aspirin
- Heparin
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**CONTRAINDICATIONS TO ALTEPLASE**

- Evidence of intracranial hemorrhage on pretreatment CT
- Only minor or rapidly improving stroke symptoms
- Clinical presentation suggestive of subarachnoid hemorrhage
- Active internal bleeding
- Known bleeding diathesis, including but not limited to:
  - **Platelet count < 100,000/mm**
  - Patient has received heparin within 48 hours and has an elevated aPTT
  - Current use of oral anticoagulants (e.g., warfarin sodium) or recent use with an elevated prothrombin time > 15 seconds
- Patient has had major surgery or serious trauma excluding head trauma in the previous 14 days
- **Within 3 months any intracranial surgery, serious head trauma, or previous stroke.**
- History of gastrointestinal or urinary tract hemorrhage within 21 days
- Recent arterial puncture at a noncompressible site
- Recent lumbar puncture.
- **On repeated measurements, systolic blood pressure greater than 185 mm Hg or diastolic blood pressure greater than 110 mm Hg at the time treatment is to begin**
- History of intracranial hemorrhage
- Abnormal blood glucose ( < 50 or > 400 mg/dL)
- Post myocardial infarction pericarditis
- Patient was observed to have seizure at the same time the onset of stroke symptoms were observed
- Known arteriovenous malformation, or aneurysm
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- **Post Acute Care Therapy**
  - Antiplatelets
    - ASA/Aggrenox
    - Glycoprotein Inhibitors
    - Coumadin
    - Pradaxa- (non valvular Atrial Fibrillation)
  - Manage underlying causes
    - Cardiac
    - HTN
    - Diabetes
    - Tobacco abuse
    - Hyperlipidemia
    - If >70% carotid stenosis- surgical evaluation
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- Intracerebral Hemorrhage
  - Amyloid Angiopathy
    - Commonly causes recurrent bleeds
    - >65 yrs old
    - Subcortical, rarely affects deep structures
    - Can cause multiinfarctional dementia
    - Also found in alzheimer patients - unclear association
    - Occasionally can be associated with subarachnoid
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- **Intracerebral Hemorrhage**
  - Hypertension
  - Gradual and smooth onset of symptoms
  - Putamen > Thalamus > Pons > Cerebellum
    - Putamen
      - Contralateral hemiparesis/sensory loss/hemianopsia
      - Acts just like a middle cerebral infarct
    - Thalamus
      - Contralateral hemiplegia/hemianesthesia/sensory > motor
    - Pons
      - Coma/pinpoint pupils/complete paralysis
      - Can have decerebrate posturing bilaterally
    - Cerebellum
      - Acute dizziness/ataxia/vomiting
      - No mentation change or loss of consciousness
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- **Subarachnoid Hemorrhage**
  - Cerebral saccular aneurysm bleed
    - Usually Circle of Willis
    - IC=40%/AC=35%/MC=20%
  - Hypertensive hemorrhages with ventricular rupture
  - A-V Malformations
  - Symptoms
    - Acute/Severe headache (thunderclap)-unresponsive to meds
    - May be alert/confused /comatose
    - No focal neurological signs
    - Neck stiffness is classic- but not always present
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- **Hemorrhagic Stroke Work Up**
  - Computerized Tomography
  - (CT misses 10% of Bleeds)
  - Lumbar Puncture
  - Xanthochromic supernatent is diagnostic
  - If LP (-) can be hours before blood gets in CSF
  - Cerebral Angiography
  - Can rebleed in 24 hours/Vasospasm

- **Treatment**
  - Neurosurgery consult
  - ABC’S/Hemodynamic control/Nimodipine/Mannitol
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- Multiple Sclerosis
  - Myelin deterioration
    - Brain
    - Spinal Cord
    - Optic Nerve
  - Pathophysiology
    - 10x more common in northern latitudes
    - May be viral in origin—Female 2:1 Males
    - Autoimmune but does have genetic components
    - Onset 20-50 yrs of age
    - Plaques
      - Cause a mononuclear inflammation
      - Demyelination with axonal sparing
      - Oligodendroglial cell loss and astrocyte proliferation
      - Long standing lesion Astrogliosis
Stroke and Multiple Sclerosis

 Symptoms

• Mononeuropathy +/- multiplex
• Optic neuritis
• Ophthalmoplegia
• Intermittent Diplopia
• Extremity weakness
• Tremors
• Lhermitte sign

  • (Paresthesias radiating down the spine into extremities on neck flexion)
Multiple Sclerosis-H&E STAIN
Stroke and Multiple Sclerosis

• **Types of Multiple Sclerosis**
  • Benign
    • No occurrence after initial
  • Relapsing-remitting
    • Most common
    • Has attacks followed by none then reoccurs
  • Primary-Progressive
    • Men
    • Gradual decline few plateaus
  • Secondary-progressive
    • Stage II relapsing-remitting. No periods of remission
  • Progressive-relapsing
    • Rare. Progressive form until the end
  • Malignant (Marburg Variant)
    • Very rare. Decline to death in few months
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• Diagnostic Tests

• MRI – TEST OF CHOICE - Brain/Spinal Cord
  • White plaques
• Evoked Action Potentials
  • Silent lesions
• Lumbar Puncture
  • Increased IgG / Oligoclonal IgG bands in CSF
  • Elevated protein
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**Treatment**

- **Acute Phase/Initial**
  - Steroids  500mg daily x 5 days
- **Relapsing-Remitting**
  - Beta-interferons
    - Avonex
    - Betaseron
    - Rebif
    - Tysarbi
  - Copolymer
    - Copaxone
- **Chronic/Advanced**
  - Novantrone
Stroke and Multiple Sclerosis

• 34 yr old with history of ataxia, ophthalmoplegia and paresthesia of the legs intermittently with a massive weight loss over the past few months. His history is significant for HIV and has been on gancyclovir and protease inhibitors and T-cell counts have remained <200. His mentation is going quickly and he has no memory and has stopped eating.

• What is your diagnosis?
Stroke and Multiple Sclerosis

- Answer
- PML
Stroke and Multiple Sclerosis

- Central Pontine Myelinolysis
  - Occurs in patients with severe hyponatremia
  - Their sodium is corrected too aggressively
  - Quadraparesis
  - Mutism
  - Pseudobulbar palsy
  - Swallowing dysfunction
- Treatment
  - Correct Na slowly