Is It a Mimic or a Stroke? Key Indicators to Help Your Staff

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Disclosures

• Wendy J. Smith - I have no actual or potential conflict of interest in relation to this presentation.
• Lori M. Massaro - Member of the speakers bureau – Genentech, Inc
Objectives

• Discuss stroke mimics and identify key indicators for identifying a mimic versus a stroke:
  • Define
  • Signs and symptoms
  • Tests

Stroke Mimics

• Research shows mimic rates of 9-31% in the suspected acute stroke population.
• Most common mimics: seizure, encephalopathy, syncope and migraine.
• Manifestation of nonvascular disease with a stroke like clinical picture.
• Mimics resemble or may even be indistinguishable from acute stroke symptoms.
• May be within the central nervous system or other systemic events.
• Discovery usually with clinical testing, history taking- or sometimes only discovered after extensive neurological imaging and testing.
Migraine

• May precipitate a stroke
• Variants of migraines
  • Hemiplegic migraine- where there is unilateral hemiparesis that lasts longer than the headache.
  • Migraine with aura
  • Aura without headache

• Extremely hard to diagnose

Hemiplegic Migraine

• May start in childhood and then disappear in adulthood.
• Symptoms vary and are unique to the individual
• May or may not have headache pain with the paralysis
• Symptoms may include:
  • Severe headache
  • Pins and needles feeling,
  • Numbness on one side of body
  • Weakness/paralysis on one side of body
  • Loss of balance or coordination
  • Language difficulties
  • Slurred Speech
  • Dizziness/vertigo
  • Nausea/vomiting
  • Confusion
  • Decreased LOC
Hemiplegic Migraine

- Symptoms last 5 minutes to an hour
- May cause long lasting difficulty with movement and coordination
- Cause: Genetics
- Testing includes: CT and MRI of head → rule out Stroke.

Migraine with Aura

- Less the 20% of all migraines
- Symptoms:
  - Nausea/vomiting
  - Yawning
  - Irritability
  - Low blood pressure
  - Sensitivity to light, sounds or motion
  - Weakness
  - Paresthesia
Migraine with Aura

• Diagnosis:
  • CT/MRI Head
  • Blood tests
  • Family history
  • Allergies
  • Medications

Aura without Headache/Silent Migraine

• Symptoms:
  • Headache
  • Nausea/Vomiting
  • Confusion
  • Blind spots
  • Tunnel vision
  • Numbness in the body
  • Difficulty speaking
• Cause: overstimulation and then depression of the nerve cell activity
• Diagnosis: CT/MRI of Head
  • Neurology workup
Hypoglycemia

- May present with:
  - Hemiplegia
  - Aphasia
  - Drowsy
  - Confusion
  - Decreased LOC
- Defined as a blood glucose level of less than 45 mg/dl
- Point of care testing for blood glucose with treatment

Hyperglycemia

- Blood glucose > 200 mg/dl, symptoms may not start until 250-300 mg/dl.
- Signs and symptoms:
  - Blurred vision
  - Fatigue
  - Stupor
  - Seizures
  - Coma
- Diagnosis - Point of care blood glucose test
Mass Lesions

- Subdural hematomas
- Cerebral abscess
- Primary CNS tumors
- Metastatic tumors
- AVMs

Presentation is usually with a slowly increasing mass and progressive symptoms - rare that the symptoms have sudden onset.

Mass Lesions

- Signs and symptoms:
  - Headache
  - Nausea/vomiting
  - Vision changes
  - Memory loss
  - Confusion
  - Seizures
  - Difficulty moving
- Diagnosis: CT/MRI Head
  - With contrast
Epilepsy and Seizures

- Focal and general seizures can cause transient neurological symptoms
- Symptoms start abruptly
- Symptoms spread quickly

Seizures and Postictal States

- Postictal weakness/Todd’s Paralysis may follow partial motor seizures or generalized seizures
  - Accounts for almost 20% of stroke mimics
  - May last up to 48 hours.
  - Some seizures may mimic limb weakness
- Seizures may also be present as a complication of an acute stroke
- Diagnosis: CT/MRI, EEG, Neurological Testing → often R/O stroke.
Transient Global Amnesia (TGA)

• Sudden, temporary episode of memory loss not attributed to a stroke or epilepsy.
• Recall of recent events vanishes
• Will recall who you are and recognize individuals in your life.
• Symptoms:
  • Sudden onset of memory loss- verified by witness
  • Retention of personal identity despite memory loss
  • Normal cognition- recognize common objects
  • Absence of signs indicating damage to the brain- paralysis, involuntary movement, or impaired word recognition

Transient Global Amnesia

• Diagnosis:
  • Duration of 24 hours or less
  • Gradual return of memory
  • No evidence of seizures
  • No history of active epilepsy
  • CT/MRI, often R/O stroke

• Possible Causes:
  • Link to migraine?
  • Mild head trauma
  • Acute distress
Sepsis

- Accounts for 12% of stroke mimics
- Signs and symptoms:
  - Altered mental status
  - High blood glucose without diabetes
  - Fever
  - HR > 90 bpm
  - Increased respiratory rate
  - Edema
  - Low blood pressure

Sepsis

- Diagnosis:
  - Must have 2 of the following symptoms:
    - Temp above 101F or below 96.8F
    - HR > 90 BPM
    - Respiratory rate higher than 20 breaths/minutes
    - Probable or confirmed infection — blood tests, urine tests.....
  - CT/MRI
Encephalopathy

- Abnormal brain function due to issues with brain tissue.
- Symptoms:
  - Decreased level of consciousness
  - Abnormal thought processes
  - Incoordination
  - Ataxia
  - Abnormal vision or eye movement
  - Weakness or numbness on one side of body- including facial droop and speech problems.
  - Loss of sensation
  - Symptoms are based on basic cause

Encephalopathy

- Diagnosis:
  - History: past medical history, social history, length of symptoms
  - Medications, Chemical exposure, infections
  - Testing:
    - CBC, Chemistries, Tox screens
    - Xray, CT, MRI
    - Lumbar puncture
Drug Overdose

- Depending on the drug
- Symptoms:
  - Temperature variation, respiratory rate, blood pressure - may be increased or decreased or absent
  - Decreased level of consciousness, confusion, coma
  - Chest pain
  - Shortness of breath
  - Nausea/vomiting
- Diagnosis:
  - History and physical
  - Tox screen

Psychosomatic/Conversion Disorder

- Functional neurological symptom disorder - psychological stress manifests physically.
- Symptoms appear with no underlying physical cause.
- Symptoms affect movement or senses.
  - Weakness or paralysis
  - Abnormal movement - tremors or difficulty walking
  - Loss of balance
  - Difficulty swallowing
  - Seizures or convulsions
  - Decreased level of consciousness
  - Numbness or loss of touch sensation
  - Speech problems: inability to speak or slurred speech
  - Vision problems - double vision or blindness
  - Hearing problems
Psychosomatic/Conversion Disorder

- Diagnosis-Criteria from DSM.
- Testing:
  - Simple testing- reflexes
  - Xray, CT, MRI
  - EEG
  - Often rule out: Stroke, Parkinson’s, Epilepsy, Lupus, Guillain Barre, Myasthenia gravis

Labyrinthitis/Meniere’s Disease

- Inflammation of inner ear structure.
- Symptoms:
  - Vertigo
  - Nausea/Vomiting
  - Loss of balance
  - Mild headache
  - May be worse by moving the head.
  - Life long symptoms = Meniere’s disease
- Testing:
  - History and physical, try to reproduce symptoms by moving the head
  - CT/MRI
  - Hearing test
Hypoxemia

- Low blood oxygen from: blocked airway, anemia, ARDS, medications, COPD, emphysema, high altitude, pneumonia, pulmonary issues, sleep apnea
- Symptoms:
  - Confusion
  - Increased heart rate
  - Increased respiratory rate
  - Shortness of breath
  - Skin color change
- Testing: Pulse Ox, CBC, Chemistries, Xray, Sleep studies

Delirium

- Physical or mental cause: alcohol or drug withdrawal, drug abuse, electrolyte/chemical disturbances, infections, poisons, surgery.
- Symptoms:
  - Decreased level of consciousness
  - Decreased feeling of sensation/perception
  - Changes in movement
  - Confusion
  - Loss of short term memory/recall
  - Movements triggered by nervous system
- Tests: CBC, Chemistries, Urine analysis, Spinal tap, EEG, CT, MRI
**Hyponatremia**

- Abnormally low sodium level in blood.
- Symptoms:
  - Nausea/Vomiting
  - Headache
  - Confusion
  - Loss of energy or fatigue
  - Muscle weakness or cramps
  - Seizures
  - Coma
- Tests: History and physical, blood and urine testing (Chemistries)

**Vestibular Neuritis**

- Symptoms:
  - Vertigo
  - Nausea/vomiting
  - Motion intolerance
  - Gait instability
  - May last days to weeks
- 70% of patients with Acute Vestibular Syndrome are Vestibular neuritis and 25% are posterior fossa ischemic strokes.
- MRI 80-85% sensitivity to pick up.
- Consider using vestibulo-ocular reflex with a Horizontal impulse test device.
HIV infections

• 250,000 individuals in the US that are unaware of their HIV infection.
• Symptoms:
  • Speech difficulty
  • Unilateral sided weakness
  • Seizures
• Diagnosis- Consider HIV tests

Stroke Versus Mimic

• Hand (2006), studied 350 brain attack patients and found that 31% were a stroke mimic.
• Mimics were more likely: history of cognitive impairment, patient lost consciousness, seizure at onset, patient could still walk, no lateralizing symptoms, or symptoms did not conform to know vascular territory.
• Stroke more likely: focal symptoms, patient well in the last week, exact time of onset.
Characteristics of Mimics

- 10 year study by Merino, et al. on over 8000 stroke patients found around 30% were a mimic.
- Common characteristics:
  - Younger
  - Women
  - No risk factors
  - Arrived by car
  - Onset while inpatient
  - Lack a history of: HTN, A-fib or hyperlipidemia

Diagnosing Mimics

- Consider rapid, short sequence MRI
- Laboratory tests: CBC, Chemistries, Glucose, Tox screens, Troponins
- Good history and physical
- Perfusion and/or diffusion weighted imaging
Safety of tPA in Mimics

• Is tPA safe in mimics?
  • Chernyshev et. al. (2010) found that 14% of the patients that received tPA were stroke mimics.
    • Average age 55
    • Initial NIHSS 7
    • Discharge NIHSS 0
    • Average LOS 3 days
  • 0 instances of symptomatic ICH

Sources

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