Aurora Health Care

SOUTH EMS REGION

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1st Quarter 2009 CE Packet

Stroke

Stroke is a nonspecific term encompassing a heterogeneous group of pathophysiologic causes, including, thrombosis, embolism and hemorrhage. There are two types of stroke.

Hemorrhagic Stroke is when bleeding occurs directly into the brain parenchyma. The usual mechanism is thought to be leakage from small intracerebral arteries damaged by chronic hypertension. Hemorrhagic strokes have a predilection for certain sites of the brain, including the thalamus, putamen, cerebellum, and brain stem. In addition to the area of the brain injured by the hemorrhage, the surrounding brain can be damage by pressure produced by the mass effect of the hematoma. A general increase in intracranial pressure may occur.

Ischemic Stroke occurs when there is sudden loss of blood circulation to an area of the brain, resulting in a corresponding loss of neurological function, also called CVA (Cerebral Vascular Accident) or stroke syndrome. Ischemic stroke most often is caused by extracranial embolism or intracranial thrombosis, but may also be caused by decreased cerebral blood flow. On the cellular level, any process that disrupts blood flow to a portion of the brain unleashes an ischemic cascade, leading to the death of neurons and cerebral infarction.

Frequency

Hemorrhagic stroke accounts for 10-15% of all strokes. Recent reports indicate an incidence exceeding 500,000 new strokes of all types per year.

Mortality/Morbidity

Stroke is the third leading cause of death and the leading cause of disability in the US. Morbidity is more severe and mortality rates are higher for hemorrhagic stroke than for ischemic stroke. Only 20% of patients regain functional independence. The 30-day

mortality rate for hemorrhagic stroke is 40-80%. Approximately 50% of all deaths occur within the first 48 hours.

Race, Age, and Sex

African Americans have a higher incidence of hemorrhagic and ischemic strokes than other races in the United States. The incidence of hemorrhagic stroke in the Japanese population is increased. Men are at higher risk for stroke than women. Additionally, women seem to respond better than men to interventions such as TPA. Although stroke often is considered a disease of elderly persons, 25% of strokes occur in persons younger than 65 years.

History

- **Stroke should be considered in any patient presenting with an acute neurologic deficit (focal or global) or altered level of consciousness.**
- **No historical feature distinguishes ischemic from hemorrhagic stroke, although nausea, vomiting, headache, and change in level of consciousness are more common in hemorrhagic strokes.**
- **Common symptoms of stroke include abrupt onset of hemiparesis, monoparesis, or quadriparesis; monocular or binocular visual loss; visual field deficits; diplopia; dysarthria; ataxia; vertigo; aphasia; or sudden decrease in the level of consciousness.**
- **Although such symptoms can occur alone, they are more likely to occur in combination.**
- **Establishing the time of onset of these symptoms is of paramount importance when considering patients for possible thrombolytic therapy. An essential question is, "When was the patient last seen normal?" It is advisable for emergency clinicians to rapidly enlist the assistance of family members or relatives to establish time of onset and to identify other pertinent components of the patient's history of presentation. The median time from symptom onset to ED presentation ranges from 4-24 hours in the United States.**
- **Multiple factors contribute to delays in seeking care for symptoms of stroke.**
-
    - **Many strokes occur while patients are sleeping (also known as "wake-up" stroke) and are not discovered until the patient wakes.**
    - **Stroke can leave some patients too incapacitated to call for help.**
    - **Occasionally, a stroke goes unrecognized by the patient or their caregivers.**
    - **Stroke mimics commonly confound the clinical diagnosis of stroke. One study reported that 19% of patients diagnosed with acute ischemic stroke by neurologists before cranial CT scanning actually had noncerebrovascular causes for their symptoms. The most frequent stroke mimics include seizure (17%); systemic infection (17%); brain tumor (15%); toxic-metabolic cause, such as hyponatremia (13%); and positional vertigo (6%). Miscellaneous disorders mimicking stroke include syncope, trauma, subdural hematoma, herpes encephalitis, transient global amnesia, dementia, demyelinating disease, myasthenia gravis, Parkinsonism, hypertensive encephalopathy, and**

conversion disorders. A critical masquerading metabolic derangement not to be missed by providers is hypoglycemia.

Physical

- **Intracerebral hemorrhage (ICH) may be clinically indistinguishable from ischemic stroke.**
- **Hypertension commonly is a prominent finding.**
- **An altered level of consciousness or coma is more common with hemorrhagic strokes than with ischemic strokes. Often, this is due to an increase in intracranial pressure.**
- **Focal neurological deficits**
    - **The type of deficit depends upon the area of brain involved.**
    - **If the dominant hemisphere (usually left) is involved, a syndrome consisting of right hemiparesis, right hemisensory loss, left gaze preference, right visual field cut, and aphasia may result.**
    - **If the nondominant (usually right) hemisphere is involved, a syndrome of left hemiparesis, left hemisensory loss, right gaze preference, and left visual field cut may result. Nondominant hemisphere syndrome also may result in neglect when the patient has a left-sided hemi-inattention and ignores the left side.**
    - **If the cerebellum is involved, the patient is at high risk of herniation and brainstem compression. Herniation may cause a rapid decrease in the level of consciousness, apnea, and death.**
    - **Other signs of cerebellar or brainstem involvement include the following:**
        - **Gait or limb ataxia**
        - **Vertigo or tinnitus**
        - **Nausea and vomiting**
        - **Hemiparesis or quadriparesis**
        - **Hemisensory loss or sensory loss of all 4 limbs**
        - **Eye movement abnormalities resulting in diplopia or nystagmus**
        - **Oropharyngeal weakness or dysphagia**
        - **Crossed signs (ipsilateral face and contralateral body)**
        - **Many other stroke syndromes are associated with ICH, ranging from mild headache to neurological devastation. At times, a cerebral hemorrhage may present as a new-onset seizure.**

Causes

- **Hypertension (up to 60% of cases)**
- **Advanced age (risk factor)**
- **Cerebral amyloidosis (affects people who are elderly and may cause up to 10% of ICHs)**
- **Coagulopathies (e.g., due to underlying systemic disorders such as bleeding diathesis or liver disease)**
- **Anticoagulant therapy**
- **Thrombolytic therapy for acute myocardial infarction (MI) and acute ischemic stroke (can cause iatrogenic hemorrhagic stroke)**
- **Abuse of cocaine and other sympathomimetic drugs**

- **Arteriovenous malformation**
- **Intracranial aneurysm**
- **Vasculitis**
- **History of prior stroke (risk factor)**
- **Diseases associated with increased blood viscosity and the use of oral contraceptives place patients at a higher risk for ischemic stroke.**
- **Previous TIA**

Transient Ischemic Attack (TIA)

(Transient Ischemic Attack) – a neurological deficit that resolves within 24 hours. Roughly 80% resolve within 60 minutes. TIA's precede nearly 30% if ischemic stokes.

Treatment

RAPID TRANSPORT!!! Stokes are to be treated as a life threatening emergency and should be transported emergently to the closet appropriate facility. Treat problems with ABC's as they present themselves. Get onset time of symptoms from family members if possible.

ECG should be obtained for all patients with acute stroke because as many as 60% of all cardiogenic emboli are associated with atrial fibrillation or acute MI.

Some reports have also recommended continuous cardiac monitoring for all patients, since 4% of patients have a life-threatening arrhythmia during the course of their illness and 3% have concurrent MI. Acute ischemic stroke has been associated with acute cardiac dysfunction and arrhythmia, which then correlate with worse functional outcome and morbidity at 3 months.

Suspected CVA

LEVEL	Suspected CVA
FR B V I P	1. **Initial Medical Care – Special Considerations:** • If BP is greater than 90 mmHg: elevate head of bed 15-30 degrees. • Protect paralyzed limbs from injury. • **Complete Neuro Alert checklist enroute to hospital.** • Consider ET/RSI if GCS < 8 • Obtain and record blood glucose levels.

Glasgow Coma Scale		Cincinnati Prehospital Stroke Scale
Eye Opening:		**Facial Droop:** have patient show teeth or smile:
Spontaneous	4	• Normal – both sides of face move equally well.
In response to speech	3	• Abnormal – one side of face does not move as well as the other side.
In response to pain	2	
None	1	
Best Verbal Response:		**Arm Drift:** have patient close eyes and hold both arms out:
Oriented conversation	5	• Normal – both arms move the same or both arms do not move at all (other findings, such as pronator grip, may be helpful).
Confused conversation	4	
Inappropriate words	3	
Incomprehensible sounds	2	
None	1	• Abnormal – one arm does not move or one arm drifts down compared with the other.
Best Motor Response:		**Speech:** have patient say "you can't teach an old dog new tricks":
Obeys	6	• Normal – patient uses correct words with no slurring.
Localizes	5	
Withdraws	4	
Abnormal flexion	3	
Abnormal extension	2	• Abnormal – patient slurs words, uses inappropriate words or is unable to speak.
None	1	

AHC-SR EMS Approved 7/01/08 Revised _____

EMS Neurologic Checklist

Aurora Health Care – South Region EMS Program

Date: _____ **Patient:** _____ **Age:** _____ **Sex:** _____

BASIC DATA

Witness Name: _____	Witness Phone: _____
Dispatch Time: _____	EMS Arrival Time: _____

Last Patient Witnessed Without Symptoms

Time: _____ Date: _____

Criteria

	Yes	No
Head Trauma at Onset		
Seizure at Onset		
Taking Warfarin (Coumadin)		
History of Bleeding Problems		

Management

- Do not treat hypertension.
- Do not allow aspiration.
  - **NPO, Head Up, O2**
- Do not give glucose (unless glucose is less than 60).
  - **IV NS, Blood Sugar** _____
- ECG Rhythm _____
  - **If AMI, 12-Lead and transmit to ED.**

"Stroke Specific" EMS to ED Report (Report Items)

Symptom Onset		Neurologic Exam	
Time (Last time w/o S&S)		Level of Consciousness	
Trauma		Speech Language	
Seizure		Motor Strength	
		Witness (Name and Contact Info)	

EXAMINATION

BP Left Arm: _____/_____	BP Right Arm: _____/_____
Departure to ED Time: _____	ED Arrival Time: _____

Additional History

Allergies: _____

Medications: _____

Past History: _____

Last Meal: _____

Events Prior: _____

Cincinnati Prehospital Stroke Scale — Check if Abnormal

Mental Status	On-Scene	Enroute
• Level of Consciousness		
• Speech		
• Questions (age, month, etc)		
• Commands		

Facial Droop	On-Scene	Enroute
• Facial Droop		

(Abnormal – one side does not move as well as other.)

Arm Drift	On-Scene	Enroute
• Motor-Arm Drift		

(Close eyes and hold out both arms. Abnormal – arm can't move or drifts down.)

- **Cincinnati scale is considered "Abnormal" for a positive-negative found during scale assessment.**

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1st Quarter 2009 CE Packet Quiz

1. **What are two types of Stroke?**

   A. Spinal and Abdominal **B. Proximal and Distal**

   C. Traumatic and Non – Traumatic **D. Hemorrhagic and Ischemic**

2. **There is a distinguishable difference in Sign and Symptoms between Hemorrhagic and Ischemic Stokes.**

   True **False**

3. **What is one key question that needs to be asked to family members regarding a patients signs and symptoms?**

   _____?

4. **What are three factors that contribute to delays in seeking emergency care?**

   1. _____
   2. _____
   3. _____

5. **What common prominent finding do most patients experience when having a Stroke?**

   A. Hypertension **B. Unresponsive**

   C. Hallucinations **D. Full Paralysis**

6. **What are three findings when the Cerebellum or Brain Stem are involved in a Intracerebral Hemorrhage?**

    1. _____

    2. _____

    3. _____

7. **What are three causes of a Stroke?**

    1. _____

    2. _____

    3. _____

8. **What is the definition of a TIA (Transient Ischemic Attack)**

    _____

9. **What are TIA's precursors for?**

    A. Obesity **B. Stroke**

    C. MVA **D. Non of the above**

10. **When treating a patient having a Stroke in the field, what does this patient need the most?**

    _____

11. **Per AHC SREMS Protocol, what are three considerations when it comes to Initial Medical Care in a patient having Stroke symptoms?**

    1. _____

    2. _____

    3. _____

12. **What other medical condition mimics Stroke like symptoms?**

    _____

13. **What are the three tests of the Cincinnati Stroke Scale?**

1. _____

2. _____

3. _____

14. What is the name of the numeric scale is used to assess a patient's level of consciousness and what are they?

_____

15. What should accompany the patient having Stroke like symptom to the ED?

_____