The Acute Phase of Cerebrovascular Accident

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Faculty Disclosure Information

1. SPEAKER: L. Michael Peterson, D.O. Medical Director, HealthNet Aeromedical Services
2. TITLE: Acute Phase of Cerebral Vascular Accident
3. FINANCIAL DISCLOSURE: No relationship with commercial supporter
4. No discussion of off-label use of medications

EMS Objectives

- Recognition
- Pathophysiology
- Application of ASLS
- Evaluation
- Transport
- Decision Making
- Transitions of CARE
- Infusion Management
Applied Statistics

• Stokes are the number three cause of disability and number two cause of death worldwide

• Recognize the acute phase of the event

• EMS Role- get the patient to the appropriate care facility as quickly as possible

• Protection of the penumbra

EMS Application of Stroke Definitions

• Stroke - Sudden loss of focal brain function is the core feature of the onset of ischemia

• TIA - Stroke lasting less than 24 hours (old definition)

• TIA now- Stroke lasting less than ONE hour
  • Why the change? MRI showed 50% TIA patients show infarcts on DWI...
The EMS Link in CVA Management

- There is >90% sensitivity of appropriate paramedic diagnosis of acute stroke
- This percentage improves after EMS stroke education
- Emergency medicine dispatchers can decrease the 911 call-to-treatment-needle time by >10 minutes if they are able to diagnose stroke from the initial call

The EMS Role in CVA Management

- Understanding the evolution and pathophysiology of a stroke
- Recognition of the presenting signs, symptoms, severity
- Recognize mimics
- Gather pertinent information
- Appropriate assessment
The EMS Role in CVA Management

• Apply decision making
• Determine destination
• Appropriate treatment
• Appropriate transport
• Serial assessment and reporting to the receiving entity

EMS Assessment Differentials

• Transient Ischemic Attack
• Cerebral Vascular Accident
• Mimics
Transient Ischemic Attacks

- 25% of strokes are preceded by TIA
- 15% occur within 3 months (half within 48 hours)
Stroke and TIA Mimics

- Seizure (Todd’s paresis) - usually has a pre-existing lesion that matches old injury
- Headache (complicated migraine)
- Hypoglycemia
- Visual Disturbances

Significance of Time and TPA

- NNT 4.5 for 0 to 90 minutes
- NNT 9.0 for 91 to 180 minutes
- NNT 14.1 for 181 to 270 minutes
- NNT 21.4 for 271 to 360 minutes
Mechanical Therapy

- Extends window of therapy up to 8 hours
- Cath lab team
- Interventional IV tPA and retrieval devices

HPI:

- Last known normal
- Hx of TIA?
HPI:

- Was there seizure activity or LOC?
- Recent surgeries
- Focus of HPI should be to determine inclusion or exclusion criteria for rTPA
EMS Assessment

- Scales: No scale is perfect but consistent training and application is imperative
- Impairment(s) and deficits are variable from person to person, even with the same stroke

Table 2. Los Angeles Prehospital Stroke Screen (LAPSS)

<table>
<thead>
<tr>
<th>Screening Criteria</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age over 65 years</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>2. No prior history of seizure disorder</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>3. New onset of neurologic symptoms in last 24 hours</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>4. Patient was intubated or sedated (prior to event)</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>5. Blood glucose between 60 and 450</td>
<td>___</td>
<td>___</td>
</tr>
</tbody>
</table>

Exam: Look for obvious

<table>
<thead>
<tr>
<th>Facial smile / grimace:</th>
<th>Normal</th>
<th>Right</th>
<th>Left</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Drop</td>
<td>Drop</td>
<td>No</td>
</tr>
<tr>
<td>Grip:</td>
<td>No Grip</td>
<td>No Grip</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Weak Grip</td>
<td>Weak Grip</td>
<td>No</td>
</tr>
<tr>
<td>Arm weakness:</td>
<td>Drifts Down</td>
<td>Drifts Down</td>
<td>Falls Rapidly</td>
</tr>
<tr>
<td></td>
<td>Falls Rapidly</td>
<td>Falls Rapidly</td>
<td>Falls Rapidly</td>
</tr>
</tbody>
</table>

6. (Based on exam, patient has only unilateral weakness): Y/N ___ ___

If yes (or unclear) to all items above, LAPSS screening criteria met.
If LAPSS criteria for stroke met, call receiving hospital with "word" stroke. If no, then return to the appropriate treatment protocol. (Note: patient may still be experiencing a stroke even if LAPSS criteria are not met.)
Cincinnati Pre-hospital Stroke Scale

1. FACIAL DROOP: Have patient show teeth or smile.
   - Normal: both sides of the face move equally
   - Abnormal: one side of the face does not move as well as the other side

2. ARM DRIFT: Patient closes eyes & holds both arms out for 10 sec.
   - Normal: both arms move the same or both arms do not move at all
   - Abnormal: one arm does not move or drifts down compared to the other

3. ABNORMAL SPEECH: Have the patient say “you can’t teach an old dog new tricks.”
   - Normal: patient uses correct words with no slurring
   - Abnormal: patient slurs words, uses the wrong words, or is unable to speak

INTERPRETATION: If any 1 of these 3 signs is abnormal, the probability of a stroke is 72%.
MEND

1. Mental Status
2. Level of Consciousness (AVPU)
3. Speech: Repeat “You can’t teach an old dog new tricks.” (Must be perfect)

MEND

4. Wrong words/mixed up words or gibberish = Aphasia
5. Slurring or difficulty pronouncing the correct words = Dysarthria
6. Questions: AAO, ask age/month
7. Commands: Opens/closes eyes on command
MEND

Cranial Nerves:

1. Facial droop: Teeth exposure while smiling, forehead wrinkles equally.
2. Visual fields: Can see finger movement in all four quadrants
3. Horizontal gaze: Can smoothly follow finger from extreme right to extreme left and back

MEND

Limbs:

1. Motor: Arm drift- Can lift both arms and can hold both arms in the air
2. Leg drift- Same as arms
3. Sensory: Can feel pinch vs. poke vs. light touch
4. Coordination (cerebellum): Can follow finger to nose without wobbly tracking and can perform heel-to-shin drag appropriately
EMS Decision Tree

“Time is Brain”
EMS Pre-Planning

- Assess
- ACT
- Treat
- Transport

EMS Management

- Approximately 8% of patients will be eligible for tPa
- Lay patients flat
- Manage hydration, glucose, reduce aspiration risk
- Look out for mimics
EMS Management

- Time is Brain
- Thrombolytics are Standard of Care
- Low NIH Score may not prohibit administration
- Don’t get aggressive with BP (185/110 prior to Alteplase)

Determining Destination

- Time and distance to nearest ER
- Time and distance to nearest stroke center
- Do we need ALS intercept?
- Is air transport a possibility?
- Capability and capacity of the receiving facility?
Where to Take the Patient?

• “Stroke Team”- Multidisciplinary (docs, nurses, pharm, PT, OT, dietitian, etc.) focus on discharge

• “Stroke Center”- Voluntary certification of a facility willing to give rTPA. Focuses on continuum of care

• “Comprehensive Stroke Center”- Specific expertise (neurologist, neurosurgery), advanced imaging capabilities, endovascular abilities, (Motola, 2010)

Take Aways for EMS

• The priority is time management
• Proper and thorough assessment/recognition
• Begin appropriate treatment
• Avoid tunnel vision
Take Aways for EMS

- Recognition of important members of the team
- Route the patient to the most appropriate facility
- Provide clear and concise communication
Recommendations

• ASLS mandatory
• Involve EMS as major member of the stroke team
• Standardize the assessment process
• Streamline transport

Recommendations

• Designate the appropriate receiving facility
• Clear and concise communication
• Focused transition of care
• Management of critical drips and appropriate blood pressure
• Expand and focus on programs such as this
Works Cited and Referenced


