Treatment of a Stroke patient: A look at how to care for the Stroke patient in the aeromedical setting

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Vanderbilt LifeFlight
Objectives

1. Discuss the assessment of the Stroke patient in the aeromedical setting
2. Identify treatment difference of a known Stroke versus unknown
3. Discuss the activation of a STROKE ALERT in the aeromedical setting
Cerebrovascular disease includes two clinical syndromes

• Ischemic cerebrovascular disease
• Hemorrhagic cerebrovascular disease
Ischemic cerebrovascular disease
Most common

• cerebral thrombosis
• cerebral embolism
• Tissue Plasminogen Activator (tPA) is considered a Class IA treatment for acute ischemic stroke
• It must be administered within 3 hours of onset of symptoms
Hemorrhagic cerebrovascular disease

Causes:

• Hypertensive intracranial hemorrhage
• Ruptured cerebral aneurysms with subarachnoid hemorrhage.
Primary goals
Aeromedical

• Prevent additional cerebral insult
• Get the patient to a STROKE CENTER within 3 hours of onset of symptoms
Assessment

• Primary Assessment: A-B-C
• Neuro Status
  – Level of Consciousness
  – Pupillary response
  – Onset of symptoms
  – Vitals Signs
  – Cincinnati Score
CINCINNATI STROKE SCALE

• A screening tool that identifies patients with strokes.
• It evaluates three major physical findings.
  – Facial droop
  – Motor arm weakness
  – Speech abnormalities
Facial Droop

- Have the patient show their teeth or smile.
- Normal – both sides of the face move equally well
- Abnormal – one side of the face does not move as well as the other side
Arm Drift

• Have the patient close his/her eyes and hold both arms out.

• Normal – both arms move the same way, or both arms do not move at all.

• Abnormal – one arm does not move or one arm drifts down compared to the other arm.

*Other findings such as pronator grip, may be helpful*
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 inappropriate words, or is unable to speak
Cincinnati Pre-hospital Stroke Scale

- Patients with 1 of these 3 findings - as a new event - have a 72% probability of an acute stroke.
- If all 3 findings are present the probability of an acute stroke is more than 85%
- Immediately contact medical control and call a STROKE ALERT
LifeFlight Encounter

• Primary Assessment: ABC
• If GCS is < 8, provide an advanced airway
  – Avoid nasal intubations and NG tube placement
• Supplemental oxygen and pulse oximetry
• Cincinnati Stroke Scale
• Check blood glucose. If glucose < 60, give one amp D50 IVP.
• Large bore IV access
• Administer sedation and pain control if indicated
• Elevate HOB to 30 degrees unless patient is hypotensive
• Perform 12 lead EKG
  – Monitor the cardiac rhythm and treat dysrhythmia per ACLS protocols
• Differentiate between ischemic or hemorrhagic stroke
Treatment

• treatment is directed at maximizing cerebral oxygenation and blood flow (cerebral perfusion pressure)
• controlling intracranial pressure (ICP)
• managing associated conditions such as dysrhythmias or seizures.
• Prevent further brain injury due to excessive hypertension without compromising cerebral perfusion pressure.
Treatment/Interventions

- Slow and careful afterload reduction should be initiated for the extremely hypertensive patient.
- For patients with signs of stroke and no CT (not known if it is ischemic or hemorrhagic) the recommendations are:
  - a. If SBP >220 and/or DBP <120, slowly lower MAP by 15-20%.
- For patients with Stroke and known hemorrhagic component the BP goals are more aggressive.
  - a. Obtain a BP of approximately 140/90 mmHg.
Medication

- Labetalol (Normodyne)
- Cardene (nicardipine)
- Vasotec (enalapril maleate)
- Hydralazine (Apresoline)
Labetalol (Normodyne)

- 10 mg IVP over 1-2 minutes
- May repeat q 10 minutes; total dose not to exceed 150 mg
- Nonselective Beta and Alpha Blocker
- For those patients with known hemorrhagic component administer labetalolol and transition to nicardipine infusion.
- Labetalol is contraindicated in asthma/COPD, heart block/bradycardic, and cardiogenic shock
Cardene (nicardipine)

- 5-15 mg/h, Max 15 mg/h. Increase by 2.5 mg/h q 5-15 minutes
- Concentration: 25mg/250ml NS: Initial dose=25ml/hour=2.5 mg/hour
- Calcium Channel Blocker: more selective to vascular smooth muscle than cardiac muscle w/ little negative inotropic effect
- Contraindicated in severe CHF; sick sinus syndrome, second or third-degree AV block, or hypotension (<90 mm Hg systolic)
Vasotec (enalapril maleate)

- 1.25 mg IV over 2-5 minutes
- May repeat once if inadequate response
- Inhibits angiotensin-converting enzyme which leads to decreased vasopressor activity
- Contraindicated in acute renal failure; hyperkalemia
  - (What pt. population would you avoid?)
  - Renal
  - Unsafe in pregnancy
Hydralazine (Apresoline)

- 20-40 mg IV or IM
- Decreases b/p by a peripheral vasodilation effect via direct relaxation of vascular smooth muscles
- Do not give if discolored
- Contraindicated in patients with CAD, or valvular rheumatic heart disease
- Safe to use in pregnancy
Case Study

• LF3 respond scene flight meeting Any town EMS at PLEA 100 for Adult Altered Mental Status possible stroke

• Enroute discussion between crew members plan of care
Case Study

• Scene:
  – Across the room Assessment
    • EMS has a 70 yo male with 100% NRB
    • Cardiac Monitor: NSR 88 B/P reading 220/140
    • You smell vomit and you see what appears to be gastric contents
    • EMS reports pt. found by family at approximately 1830 this day last seen “normal” at during evening news
Case Study: Scene Priority Interventions

• Primary Assessment: A-B-C (60-90 seconds)
  – Do you intubate?

• GCS

• Cincinnati Stoke Scale:
  – Facial Droop: (+) Drift (+) Speech (Slurred +)

• Glucose: EMS unable to perform

• Two Large Bore IV est.

• 100% NRB per EMS

• Vital Signs: NSR 88 B/P reading 220/140
In-Flight: Scene Interventions

- (Focus Assessment: <90 Sec)
- “Load and Go”: Flight Time: 30 minutes
- Intubate in the Aircraft
- Blood Glucose 250
- Repeat Blood Pressure: 220/150
- Labetalol 10 mg 1st dose
  - For patients with signs of stroke and no CT
    • If SBP <220 and/or DBP <120, slowly lower MAP by 15-20%
    • repeat q 10 minutes; total dose not to exceed 150 mg
- Administer Sedation (Versed)/Analgesia (Fentanyl)
- AVOID PARALYTICS
- 10 Minutes Out: Report to ED STROKE ALERT: Request to meet in CT Scan
Case Study: Interfacility

- 54 yo female with confirmed Hemorrhagic Bleed
- Vitals: 220/150 HR 60 Intubated
- Labetalol 60 mg given with no response
- Family reports last seen normal night time news; Pt. woke spouse up at 2300 to the ED 2330 it is now Midnight
Case Study: Interfacility Transfer
Priority Interventions

• Primary Assessment: A-B-C (60-90 seconds)
  – Confirm ETT placement
  – In-Line End Tidal CO2 (Keep 35-45)

• GCS
  – Eye:1 Verbal:1T Motor: 4 (withdraws from pain)

• Cincinnati Stoke Scale: CT confirmed ICH

• Glucose: 240

• Two Large Bore IV est.

• Vital Signs: NSR 60 B/P reading 220/140
Interfacility: In-Flight

- Flight Time: 40 minutes
- Labetalol? (Max dose is 150 mg)
- Cardene Drip: 25mg/250ml start at 2.5mg/hour:
  - Increase by 2.5 mg/h q 5-15 minutes
  - Cardene Max @ 15mg/hour
- B/P: 170/110: What is next?
- Vasotec 1.25 mg IV over 2-5 minutes
- 10 Minutes Out: Report to ED STROKE ALERT
Conclusion

• Time is Brain
  – Get the patient to a Stroke Center within 3 hours of onset of symptoms (maybe extended to 4.5 hours)

• Aero Medical treatment is directed at maximizing cerebral oxygenation and blood flow cerebral perfusion pressure
Conclusion

• Early detection of Stroke in the aeromedical setting can have a dramatic effect of the mortality and morbidity of patients.

• In depth neurological exams are not only unnecessary in the aeromedical settings but can in fact be counter productive.