Squad Review

MCEMS

Winter/Spring 2012
Acute Stroke/TIA and MCEMS

Bobby Dery MD
Colorado West Emergency Physicians,
St. Mary’s Hospital and Medical Center,
Grand Junction, Colorado.
Medical Director, Mesa County EMS.
ems.mesacounty.us
Goals:

1) Discuss what occurs at the ED end of these cases- try to reinforce why what you do/think/chart matters.
2) Review lytic therapies, timelines, and other key issues.
3) Discuss MCEMS stroke timelines and protocol.
4) Discuss MCEMS “Destination Protocol” for CVA/TIA’s.
5) Review essential charting requirements for CVA/TIA.
6) Review the Cincinnati Stroke Scale- it is now required for all possible CVA/TIA patients.
7) Review recent Good, Bad and Ugly MCEMS PCR’s.
8) Avoid putting you to sleep.
**Case Study - Pre-hospital**

**S:**
EMS dispatched for an 80 year old diabetic male. Blurred vision and confusion. Began at 1300- 2.5 hours ago. NH staff provides no useful information other than he seemed to have a seizure at some point. Pt. c/o headache and “my R arm feels funny”.

**O:**
A&O x2; 190/100; 90; 18 unlabored; 95% RA; BG 100.
No signs of trauma/fall;
Eyes locked to LEFT;
Right facial droop;
Right arm can barely fight gravity when held up, drifts downward immediately.
Misses several words, and slurs others, trying to repeat “You can’t teach an old dog new tricks”.
Case Study - Pre-hospital

A: Acute CVA or TIA c symptoms for 2 1/2 hours; ?Seizure?.

P: Primary and secondary surveys performed; Monitor; SaO2; EKG performed (afib?); O2 held as SaO2>92%; Large bore IV, and blood tubes drawn; Stroke Alert called to the ED;
  • CVA/TIA Radio Report Checklist used for call-in. Code 3 transport (if safe and saves time);
“ED notified of possible CVA/TIA” written in Plan (this is a Primary Stroke Center EMS documentation requirement- just do it, OK.)
Case Study- SMH ED course

• CT scanner cleared when Stroke Alert from EMS received.
• Stroke neurologist at Swedish Medical Center brought online through the tele-medicine camera.
• Rapid eval by EDP and stroke neurologist:
  • History, timeline and risk-factors reviewed
  • Physical exam
  • NIH Stroke Scale performed
• Weight-based dose of lytic (“clot busting”) drugs being mixed in pharmacy while patient goes to CT scanner.
• EMS bloods to lab stat. (BG, platelets, coags)
• CT, blood work reviewed; physical exam/NIH repeated.
• Lytics given, with “Door to needle time” (DTN) of 40 minutes; total time since onset of symptoms of 3.5 hours.
“Clot busting” (lytic) drugs:

- tPa is the FDA approved IV lytic for use in acute stroke.
- Thrombolysis restore blood flow in some patients with acute ischemic stroke.
- They may lead to improvement or resolution of neurologic deficits.
- Thrombolytic therapy is of proven and substantial benefit for select patients with acute cerebral ischemia.
- The evidence base for thrombolysis in stroke includes 21 completed randomized controlled clinical trials enrolling 7152 patients.
- The feared complication is brain bleeding (about 6% of time in US cases).
“Clot busting” (lytic) drugs:

• tPa is the FDA approved lytic for use in acute stroke.

• Thrombolytics restore blood flow in some patients with acute ischemic stroke.

• They may lead to improvement or resolution of neurologic deficits.

• Thrombolytic therapy is of proven and substantial benefit for select patients with acute cerebral ischemia.

• The evidence base for thrombolysis in stroke includes 21 completed randomized controlled clinical trials enrolling 7152 patients.

• The feared complication is brain bleeding (about 6% of time in US cases).
EMS/ED Take Home Theme:

- “may lead to”...“in some...selected patients”
- Who are these “selected patients”?
- This is the entire point of the Stroke Alert system, and what EMS and the ED are trying to do.

**EMS:**
- Of all patients who might be having a CVA/TIA: which ones are clearly inside a certain timeline?

**ED:**
- Of those inside the timeline: who is the real deal, and also meets the specific and complex criteria for giving tPa?
So, the EMS/ED team...

...needs to work together to determine 3 key issues:

1. **Might the patients symptoms be due to CVA/TIA?**
   - History/symptoms/BG;
   - Physical exam:
     a. EMS- Cincinnati Stroke Scale
     b. ED- NIH Stroke Scale
So, the EMS/ED team...

...needs to work together to determine 3 key issues:

1. **Might the patients symptoms be due to CVA/TIA?**
   - History/symptoms/BG;
   - Physical exam:
     - EMS- Cincinnati Stroke Scale
     - ED- NIH Stroke Scale

2. **Exact timeline since “last known to be normal”**.
   - EMS- window is now expanded to 3 hours for “Acute”
   - ED- <3 vs. <4.5 hours
So, the EMS/ED team...

...needs to work together to determine 3 key issues:

1. **Might the patients symptoms be due to CVA/TIA?**
   - History/symptoms/BG;
   - Physical exam:
     a. EMS- Cincinnati Stroke Scale
     b. ED- NIH Stroke Scale

2. **Exact timeline since “last known to be normal”**.
   - EMS- window is going to expand to 3 hours for “Acute”
   - ED- <3 vs. <4.5 hours

3. **If symptoms and timeline are legitimate, are they a candidate for tPa?**
   - An ED thing- but EMS notification and pace are critical.
CINCINNATI PREHOSPITAL STROKE SCALE

1. Facial Droop: Have the person smile or show their teeth.

Normal: Both sides of face move equally.
Abnormal: One side of face does not move as well as the other.

CINCINNATI PREHOSPITAL STROKE SCALE

1. **Facial Droop:** Have the person smile or show their teeth.
   - **Normal:** Both sides of face move equally.
   - **Abnormal:** One side of face does not move as well as the other.

2. **Arm Drift:** Have the person close his or her eyes and hold his or her arms straight out in front for about 10 seconds.
   - **Normal:** Both arms move equally.
   - **Abnormal:** One arm does not move, or one arm drifts down compared with the other side.

CINCINNATI PREHOSPITAL STROKE SCALE

1. **Facial Droop:** Have the person smile or show their teeth.
   
   Normal: Both sides of face move equally.
   Abnormal: One side of face does not move as well as the other.

2. **Arm Drift:** Have the person close his or her eyes and hold his or her arms straight out in front for about 10 seconds.
   
   Normal: Both arms move equally.
   Abnormal: One arm does not move, or one arm drifts down compared with the other side.

3. **Speech:** Have the person say, "You can't teach an old dog new tricks".
   
   Normal: Patient uses correct words with no slurring.
   Abnormal: Slurred or inappropriate words, or mute.
Timeline:

• Historically, tPA has only been given within 3 hours of onset of symptoms (last known to be normal).
  
  • MCEMS protocol has been <120 minutes
    • “Acute” stroke.
    • Stroke Alert called to ED.
    • Code 3 Return allowed.

• This is changing nationally, with tPA being used more frequently in the <4.5 hour window.
  
  • MCEMS protocol changed 2/9/12 to <180 minutes (3 hours)
    • “Acute” stroke.
    • Stroke Alert called to ED.
    • Code 3 Return allowed.
Timeline:

To be clear:

• “Time is brain”.
• Shorter times = better response/outcome with tPa.
• tPa at 1 hour is better than at tPa at 2 hours, etc.
• So: DO NOT dawdle because “now we have more time”.
• There is not more time- quick assessment, and get rolling.

• This is changing nationally, with tPa being used more frequently in the <4.5 hour window.

• MCEMS protocol has changed to <180 minutes (3 hours)→
  • “Acute” stroke.
  • Stroke Alert called to ED.
  • Code 3 Return allowed.
Timeline:

• In Subjective be VERY explicit about times (very):
  
  • “Symptoms began at 1330 hours; and have been present for 40 minutes at the time of our arrival.”

  Vs.

  • “Symptoms began 1 hour ago”

• What we need in the ED is as exact a “time zero” as you can ascertain.
Who gets tPA? (an ED thing I know):

- NIH Stroke Scale:
  - 11 questions; 0-34 points.
  - Very low and very high scores usually excluded from tPA.

- American Heart Association/American Stroke Association (AHA/ASA) inclusion guidelines for the administration of tPA in under 3 hours:
  - 20 different criteria that need to be reviewed;
  - EMS: deficits, timeline, BP, BG, seizure?, trauma?, platelet count, coags (i.e. full set of blood tubes).

- Inclusion criteria for administration of tPA at 3-4.5 hours are even more extensive, as the risk of bleeding are increased- more patients are excluded.
tPa Visual Decision Aid:

13/100: “normal”
19/100: “better”
62/100: “no change”
6/100: brain bleeding
100%

Of 6 with CNS bleed:
3/6: get better
2/6: worse outcome
1/6: disabled/dead

Changes in final outcome as a result of treatment:
- Normal or nearly normal
- Better
- No major change
- Worse
- Severely disabled or dead

Early course:
- No early worsening with brain bleeding
- Early worsening with brain bleeding
US stroke data:

- Get with the Guidelines AHA stroke database (2085 hospitals participate in USA)
    - 12431 received t-PA (5.2% administration rate).
  - For Colorado: 2872 ischemic strokes entered in 2011.
    - 230 received t-PA (8% administration rate).
  - For SMH: 283 ischemic strokes entered in 2010/11.
    - 27 received t-PA (9.5% administration rate).
  - For US Primary Stroke Centers:
    - ≈ t-PA 20% administration rate.
tPa at SMH 2010-2011:

- Of 464 stroke patients admitted to SMH in 2010-2011:
  - 170 came via EMS from scene (36.6%)
  - 179 came via private vehicle (38.6%)
  - 114 transfer from other hospital (24.6%)

- 27 patients received tPa:
  - 18 patients arrived via EMS = 66%
  - 7 arrived via private vehicle = 25.9%
  - 2 arrived via transfer from other hospital
SMH stroke data 2010-2011:

- Jan 2010 to December 2011 stroke admits:
  - 283 Ischemic strokes (85 TIA, 100 bleeding stroke)
  - 27/283 patients received tPa = 9.5% administration rate (stroke centers with stroke teams report ≈ 20%)
    - For 2009, 8/159 patients received TPA = 5% administration rate
  - Due to slow processes, 5 of the 27 patients received tPa in the 3-4.5 hour window when arriving less than 2 hours after symptom onset.
  - The goal for door to needle time is 60 minutes.
    - Mean door to needle time for tPa administrations was 95.5 minutes Jan 2010-Oct 2011 at SMH.
SMH tPa Complications 2010/11:

- 27 TPA administrations here

3 symptomatic brain bleeds within 36 hrs after t-PA

- This represents 11% complication rate - ≈6% norm
  - Case 1: no neurologist; Door To Needle (DTN) = 46 min
  - Case 2: 92 min. door to neurologist time; DTN = 134 min
  - Case 3: 75 min. door to neurologist time; DTN = 85 min

- 2 patients expired
  - one patient never awakened
  - one died a week later - probably resp. failure
Telemedicine:

Who gets tPa?

Swedish Medical Center

SMH ED
First two months of Tele-stroke:

Mean patient arrival to neurologist at bedside in SMH ED was **52 minutes** in study period prior to tele-stroke initiation.
Where is all this going?:

- SMH has applied for Primary Stroke Center certification—likely approved in 2012.
- 2 new fellowship-trained stroke neurologists arrive at SMH in next few months.
- 24/7 immediate stroke-neurologist coverage from Swedish will remain once new stroke neurologists are on staff.
- Decisions about destination protocols for possible stroke patients have been formalized in our EMS protocols.
- All aspects of stroke care/charting/timelines/outcomes will be more and more scrutinized—including what we do.
- As with Cardiac Alerts and Trauma Alerts, EMS can truly make a difference if we are on the ball.
Where is all this going?...

• I released a new/updated CVA/TIA protocol via the MCEMS website and the email list on 2/9/12.
• It is similar to what has been in place since 2010, but with a few key changes.
• Some aspects of the new protocol are quite different, and they are in effect as of 2/9/12:
  • Timeline, Cincinnati Scale.
• Consider this lecture, and anything I send via the website/email, as official notification of new practice guidelines/requirements.
What do you need to know?
Patient Assessment/charting:

- The timeline (when “last known to be normal”) must be investigated and specifically charted as best you are able.

- Cincinnati Stroke Scale is now required: it is our system-wide pre-hospital stroke scale as of now.

- BG check is essential- 100% is our system-wide benchmark for AMS/Intox/CVA/TIA.

- Stroke Alert is to be called for all with stroke symptoms for <3 hours (180 minutes)- this is an “acute” stroke.

- “ED notified of possible CVA/TIA” written in Plan (this is a Primary Stroke Center EMS documentation requirement- just do it, OK.)

- Stroke Alert Checkbox/Procedure must be used for all “acute” strokes.
Radio Report Checklist:

- Page Medical 10 in our protocols.

- If you have not seen it yet, I ask you to please take a quick look at it.

- It summarizes the key components of a CVA/TIA radio report which help the ED move as fast as possible.

- It is also a good guide for what should be in your PCR (i.e. a free cheat-sheet which will keep me and your QA geek off your back):
  - Specific (i.e. # of minutes) time line;
  - Cincinnati Stroke Scale;
  - Vitals, BG, seizure activity.

- Please use it to guide your radio report and your PCR.
Destination Hospital:

- National guidelines explicitly state “EMS should transport acute stroke patients to the nearest facility that operates as a Primary Stroke Center”.
- With the Swedish telemedicine group on-board, SMH currently operates as a PSC.
- The neurology group has been meeting with the hospitals in MCEMS to determine if EMS is to bypass other facilities for SMH with possible acute strokes. No clear decisions have been reached.
- So, I have published a “Destination Procedure” in the new protocol, which I expect you to follow.
Destination Hospital...

- **Remember:** medical patients get to decide where they are taken, and EMS must respect their wishes.

- That said, as with Cardiac Alerts, if EMS feels a patient is better served by the capabilities at another destination:
  
  1. EMS **cannot** divert the patient without patient consent;
  2. The EDP at requested facility **can** divert the patient;
  3. When this occurs, careful charting is essential:
     i. it is always an EDP (RN/PA at FHW/VA at certain times of day), NOT an EMT, who makes this diversion decision.

- **Remember:** Once you are on a hospitals “campus” the patient must be evaluated at that hospital, (except VA!).
  - So if you are expecting to be diverted by the EDP, call early, **before** you are on their property (CH, FHW).
Destination Hospital; my take:

In the absence of more specific guidance from Neurology at this time:

• I feel patients likely to be having a possible stroke or TIA are better served by the capabilities in place at SMH.

• I feel best MCEMS practice, if a possible stroke patient is requesting a non-SMH destination, is:
  
    1. Immediately contact the EDP at requested facility (RN/PA at FHW/VA at some times of day);
    2. State “I have an Acute Stroke, will you accept patient?”;
    3. Follow directions of EDP (RN/PA at FHW/VA at some times of day);
    4. Chart this **exactly** as it took place in your PCR.
Time is brain - get going and notify ED early

• Solid timeline charting - be explicit: onset, # minutes;
• Cincinnati scale for everyone;
• BG for everyone;
• <180 minutes is now a Stroke Alert;
• “ED notified of possible CVA/TIA” written in Plan;
• Use Stroke Alert checkbox;
• Use the Acute CVA/TIA Radio Report Checklist (Medical 10);
• SMH is most appropriate destination for possible stroke/TIA’s;
• Use clinician at other facilities to assist with destination decisions.
No mas
Destination Hospital; lastly:

• This is the biggest area of uncertainty regarding acute stroke care in MCEMS at this time- I apologize for that.

• I will get more concrete protocols in place as soon as I am able- I, too, am awaiting direction from above.

• Although I feel SMH is the most appropriate destination for possible acute strokes currently, there can be no adverse consequence on you at this time if you take your patient to other facilities.

• I will put the “Dery Destination Plan” from the previous slide on the website for ease of reference until things become more concrete.