

Why Should TIA be Treated Emergently?

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Why Should TIA be Treated Emergently?

- According to the AHA/ASA scientific statement of June 2009: “Large cohort and population-based studies reported in the last five years have demonstrated a higher risk of early stroke after TIA than generally suspected. Ten percent to 15% of patients have a stroke within 3 months with half occurring within 48 hours.”
- Because of this, high risk patients need to be stratified early to identify disease and treat it

Why Should TIA be Treated Emergently?

- We need to update our definition, urgency, and evaluation
- There is too much complacency about TIA!
- We should start thinking about these as the “Angina of the Brain”

Why Should TIA be Treated Emergently?

- **Statistics**

- Incidence of TIA in the US approximately 200,000 to 500,000/year
- Prevalence 2.3%; so approximately 5 million people
- Overall TIA incidence 1.1/1000 people

Why Should TIA be Treated Emergently?

- Definition

- TIA and stroke reflect reduced cerebral blood flow with increased risk for disability and death
- Traditionally, TIA defined as a sudden, focal neurologic deficit of presumed vascular origin lasting < 24 hours

Why Should TIA be Treated Emergently?

- 24 hour time frame arbitrary (mid 1960s)
 - Presumed no permanent brain injury, but with improved imaging this has been disproved!

Why Should TIA be Treated Emergently?

- Frequency of DWI in patients with transient neurological episodes of different durations (3)

<u>Duration of symptoms (hours)</u>	<u>DWI</u>
0-1	33.6
1-2	29.5
2-3	39.5
3-6	30.0
6-12	51.1
12-18	50.0
18-24	49.5

Why Should TIA be Treated Emergently?

- The new tissue-based definition: a transient episode of neurological dysfunction caused by a focal brain, spinal cord, or retinal ischemia, without acute infarction

Why Should TIA be Treated Emergently?

- Time window is arbitrary (whether 1 hour or 24 hours) and should use a definition which is tissue-based, as are most disease definitions in clinical medicine!
- We have a golden opportunity to avoid wrecking the brain the next 48 hours=
“URGENCY”!

Why Should TIA be Treated Emergently?

- “Stratification”

- TIA can portend CVA: short term risk of stroke is particularly high
 - Exceeds 10% in 90 days
 - Particularly high in first few days after TIA
 - One quarter to one half of strokes that occur within 3 months actually occur in the first 2 days
- This is why we need prompt evaluation and treatment!

Why Should TIA be Treated Emergently?

- ABCD Score predicts short term risk of stroke after TIA (optimized to predict stroke in 2 days after TIA, but also after 90 days)

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<u>Risk Factor</u>	<u>Points</u>
<i>Age > 60</i>	1
<i>BP: Systolic >140 mm Hg or Diastolic > 90mm Hg</i>	1
<i>Clinical feature</i> Clinical features of TIA: (choose one)	
Unilateral weakness with or without speech impairment or	2
Speech Impairment without unilateral weakness	1
<i>Duration: TIA > 60 minutes</i>	2
<i>TIA < 10-59 minutes</i>	1
<i>Diabetes</i>	1

Why Should TIA be Treated Emergently?

- In combined validation cohorts, the 2-day risk of stroke was 0% for scores 0 or 1, 1.3% for 2 or 3, 4.1% for 4 or 5, and 8.1% for 6 or 7

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- Unfortunately, these do not incorporate imaging
 - If new infarct on imaging=2-15 fold increase in subsequent short-term risk of CVA
 - If vessel occlusion on MRA=4 fold increase in short-term risk of stroke

Why Should TIA be Treated Emergently?

- **HOSPITALIZATION VERSUS OUTPATIENT EVALUATION**

- 4 or more points on the ABCD score place patients at high risk of imminent stroke
- Reasonable to hospitalize if present 3-4/7 to initiate evaluation faster to differentiate cause and determine most effective treatment

Why Should TIA be Treated Emergently?

- **HOSPITALIZATION VERSUS
OUTPATIENT EVALUATION**

- 1-2 outpatient evaluation appropriate but still do promptly
- **SAVE THE BRAIN-THINK OF THIS AS
ANGINA OF THE BRAIN**

Why Should TIA be Treated Emergently?

- **DIAGNOSTIC EVALUATION**

- Goals of neuroimaging:

- Obtain evidence of a vascular origin
 - Exclude alternative non-ischemic origin
 - Ascertain the underlying vascular mechanism (large versus small vessel, embolic) allowing optimal therapy
 - Identify prognostic outcome

Why Should TIA be Treated Emergently?

- **DIAGNOSTIC EVALUATION**

- Goals of neuroimaging

- MRI, especially diffusion-weighted, permits confirmation of focal ischemia, improves accuracy of vascular localization and cause of TIA, and extent of pre-existing cerebrovascular disease and is considered the “preferred” diagnostic test

Why Should TIA be Treated Emergently?

- **Class I Recommendations (1)**

- Patients with TIA should preferably undergo neuroimaging evaluation within 24 hours of symptom onset. MRI, including DWI, is the preferred brain diagnostic imaging modality. If MRI not available, head CT should be performed (**Class I, Level of Evidence B**).

Why Should TIA be Treated Emergently?

- **Class I Recommendations (1)**

- Noninvasive imaging of the cervicocephalic vessels should be performed routinely as part of the evaluation of patients with suspected TIAs (**Class I, Level of Evidence A**)

Why Should TIA be Treated Emergently?

- **Class I Recommendations (1)**

- Noninvasive testing of the intracranial vasculature reliably excludes the presence of intracranial stenosis (**Class I, Level of Evidence A**) and is reasonable to obtain when knowledge of intracranial steno-occlusive disease will alter management. Reliable diagnosis of the presence and degree of intracranial stenosis requires the performance of catheter angiography to confirm abnormalities detected with noninvasive testing

Why Should TIA be Treated Emergently?

- **Class I Recommendations (1)**

- Patients with suspected TIA should be evaluated as soon as possible after an event (**Class I, Level of Evidence B**)

Why Should TIA be Treated Emergently?

• **Class II Recommendations (1)**

- Initial assessment of the extracranial vasculature may involve any of the following: CUS/TCD, MRA, or CTA, depending on local availability and expertise, and characteristics of the patient (**Class IIa, Level of Evidence B**)
- If only noninvasive testing is performed before endarterectomy, it is reasonable to pursue 2 concordant noninvasive findings; otherwise, catheter angiography should be considered (**Class IIa, Level of Evidence B**)

Why Should TIA be Treated Emergently?

• **Class II Recommendations (1)**

- The role of plaque characteristics and detection of MESs is not yet defined (**Class IIb, Level of Evidence B**)
- ECG should occur as soon as possible after TIA (**Class I, Level of Evidence B**). Prolonged cardiac monitoring (inpatient telemetry or Holter monitor) is useful in patients with an unclear origin after initial brain imaging and electrocardiography (**Class IIa, Level of Evidence B**)

Why Should TIA be Treated Emergently?

• **Class II Recommendations (1)**

- Echocardiography (at least TEE) is reasonable in the evaluation of patients with suspected TIAs, especially in patients in whom no cause has been identified by other elements of the workup (**Class IIa, Level of Evidence B**). TEE is useful in identifying PFO, aortic arch atherosclerosis, and valvular disease and is reasonable when identification of these conditions will alter management (**Class IIa, Level of Evidence B**)
- Routine blood tests (complete blood count, chemistry panel, prothrombin time and partial thromboplastin time, and fasting lipid panel) are reasonable in the evaluation of patients with suspected TIAs (**Class IIa, Level of Evidence B**)

Why Should TIA be Treated Emergently?

• **Class II Recommendations (1)**

- It is reasonable to hospitalize patients with TIA if they present within 72 hours of the event and any of the following criteria are present
 - ABCD score $>$ or $=$ 3 (**Class IIa, Level of Evidence C**)
 - ABCD score of 0 to 2 and uncertainty that diagnostic workup can be completed within 2 days as an outpatient (**Class IIa, Level of Evidence C**)
 - ABCD score of 0 to 2 and other evidence that indicates that the patient's event was caused by focal ischemia (**Class IIa, Level of Evidence C**)

Why Should TIA be Treated Emergently?

- **INTERESTING FACTS**

- MES=microembolic signals identified with TCD
 - High numbers are a marker of increased risk in patients with TIA of carotid origin
 - Only 6% of patients had MES within 14 days of symptoms!
 - So not good routinely

Why Should TIA be Treated Emergently?

• INTERESTING FACTS

- CUS as a stand alone is cost effective for selecting patients for CEA, but refuted by other institutions
- Contrast-enhanced MRA most accurate for 70-99% stenosis (sensitivity 94%, specificity 93%) compared with US, MRA, CTA (sensitivity 89%, specificity 84%)
- CUS good initial test but access accuracy!

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- References

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- (2)Johnston SC, Rothwell PM, Huynk-Hunyh MN, Giles MF, Elkins JS, Sidney S. Validation and refinement of scores to predict very early stroke risk after transient ischemic attack. *Lancet* 2007;369:283-292. [slides 12, 14, 15]
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