



**“I already diagnosed myself on the Internet.
I’m only here for a second opinion.”**

TIA: THE NEAR MISS

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BACKGROUND



DEFINITION

- Traditional: rapidly developed clinical signs of focal or global disturbance of cerebral function lasting fewer than 24 hours, with no apparent non-vascular cause.
- Proposed: a brief episode of neurologic dysfunction caused by a focal brain or retinal ischemia, with clinical symptoms typically lasting less than an hour, and without evidence of acute infarction.



EPIDEMIOLOGY

- 240,000 new events per year
- 4.9 million people with history of TIA
- 3.2% never reported potential symptoms
- 15% TIA's will have CVA in 1 year
- 10% TIA's will have CVA in 90 days
- 5% TIA's will have CVA in 48 HOURS
- 90% of people do not know what a TIA is



DIFFERENTIAL DIAGNOSIS

- Seizure
- Migraine equivalent
- Metabolic disturbance
- Vestibulopathy
- Cerebral vessel aneurysm
- Ocular disorders
- Hyperventilation



HISTORICAL

- Abrupt onset
 - Immediate maximal deficit: embolus
 - Stuttering course: small vessel ASVD
 - Symptoms occur simultaneously in all affected areas
- Duration less than an hour
- Negative symptoms
- No specific provocation
- Generally no associated symptoms (e.g. headache, syncope, incontinence)



EXAMINATION

- General: B/P may be elevated
- Neck: carotid bruit
- Cardiac: irregular rhythm, murmur
- Neurologic: usually normal



RECOMMENDATIONS



PATIENT

- What
 - Risk factors
 - Symptoms
 - Action (e.g. 911)
- How
 - Primary MD
 - Determine patient's habits and risks
 - Communicate these to the patient
 - Hospitals
 - Education programs
 - Screenings
 - Literature



EMERGENCY MEDICAL SERVICES

- Dispatch
 - Train to recognize suspicious complaints
 - Communicate possibility to field personnel
- Evaluation on site
 - Pre-hospital stroke screen
 - History of preexisting conditions
- Management
 - Stabilize patient (i.e. VS, O₂, other life-threatening conditions)
 - Transport ASAP
 - IV access
 - Finger stick glucose
 - Cardiac monitor
 - NPO
 - Contact receiving ER en route



PRIMARY MD OFFICE

- Single event, more than 1 week ago
 - Start ASA (325 mg daily), if not contraindicated
 - Routine neurology consult
- Single event, less than 1 week ago
 - Start ASA, if not contraindicated
 - Urgent neurology consult
 - Initiate evaluation
- Single event, less than 48 hours ago
 - Start ASA, if not contraindicated
 - Immediate neurology consult
 - Consider admit (to expedite evaluation and treatment)
- Multiple events
 - Immediate admit and neurology consult



EMERGENCY ROOM

- Triage
 - Recognition in walk-in's
 - Determine time of symptom onset
- Evaluation
 - ER MD examination
 - Labs (CBC, BMP)
 - Imaging (head CT)
 - ECG
- Treatment
 - ASA (325 mg), if no contraindication
 - Clopidrogel (75 mg), if cannot use ASA
- Disposition
 - Confer with neurologist



NURSING

- Assessment and monitoring of patient's condition
- Assessment of patient's and family's level of knowledge of stroke
- Facilitation and education of the patient and family
- Assistance in coordination of other services for the patient's needs



FURTHER EVALUATION

- Localization in brain based on clinical symptoms
- Suspected etiology based on historical information and examination



CLINICAL LOCALIZATION

- Anterior circulation
 - Carotid doppler
 - Echocardiogram
 - MRI with diffusion-weighted images
- Posterior circulation
 - MR angiography
 - CT angiography
 - Echocardiogram
 - MRI with diffusion-weighted images
- Subcortical lacunar syndrome
 - Carotid doppler
 - MRI with diffusion-weighted images



SUSPECTED ETIOLOGY

- Cardioembolic
 - Transthoracic ECHO
 - Transesophageal ECHO
- Aortic disease
 - Transesophageal ECHO
- Coagulopathy
 - Protein C & S
 - Antithrombin III
 - Leiden Factor V
- Inflammation
 - Sedimentation rate
 - Syphilis serology
 - Serum protein electrophoresis
- Immunologic
 - Anticardiolipin antibody
 - Lupus anticoagulant
 - Antiphospholipid antibodies
- Metabolic
 - Serum homocysteine level
 - Fasting blood sugar
 - Lipid profile



IDENTIFY RISK FACTORS

- Obtain additional history
 - Past medical history
 - Social history (i.e. habits)
 - Family history
- Evaluate blood pressure trends
- Metabolic status
 - Glucose
 - Lipids
 - Serum homocysteine
- Check for coexistent heart disease
 - Coronary heart disease
 - Dysrhythmia
 - Congestive heart failure
 - Valvular heart disease



TREAT RISK FACTORS

- Hypertension
 - B/P should be lower than 140/90
 - Medication should be started 7 to 14 days after the event
 - Use ACE inhibitor unless contraindicated
 - Lifestyle changes
- Diabetes mellitus
 - Fasting blood sugar <120
 - Glycosylated hemoglobin <7%
 - Lifestyle changes



TREAT RISK FACTORS (CONT.)

- Hypercholesterolemia
 - Triglycerides <150
 - LDL <70
 - Lifestyle changes
- Tobacco
 - Smoking cessation program
- Hyperhomocysteinemia
 - Folic acid, B12, and B6
- Cardiovascular
 - Cardiac evaluation even in otherwise cardiac asymptomatic patients



TREAT ETIOLOGY

- Atrial fibrillation
 - Warfarin should be started as patient has more than one risk factor for stroke
 - INR at 2.5
 - Consider other risks to anticoagulation
- Carotid stenosis
 - <50%: antiplatelet agents
 - >50% in men & >70% in women: CEA at institution with complication risk <3%
 - >50% in men & >70% in women: consider stenting in patients with restenosis after prior CEA, poor cardiac status, prior neck irradiation, difficult surgical access, or high anesthetic risk at facility with experience



TREAT ETIOLOGY (CONT.)

- Intracranial vascular disease
 - Aspirin (50-325mg/day)
 - Aspirin/dipyridamole twice daily
 - Clopidrogel (75mg/day): if allergic to aspirin, peripheral vascular disease, or drug-eluting stent
 - Ticlopidine: if fails aspirin/dipyridamole
- Coagulation disorders
 - Warfarin is generally indicated
 - Consult Hematologist
- Prosthetic heart valve on adequate anticoagulation
 - Add aspirin 81mg daily



LONG-TERM CARE

- Reinforce risks
- Manage risks
 - Medical treatment
 - Monitoring
- Manage lifestyle
 - Tobacco
 - Physical activity
 - Diet



SURVEILLANCE

- Carotid doppler
 - Yearly if $>50\%$ stenosis at time of event
- Labs
 - Homocysteine level: 3 months after starting therapy
 - Blood glucose: dependent on diabetic status
 - Lipids: yearly
 - Coagulation parameters: dependent on etiology and treatment
- symptoms



Now I know why they call it ICU!

