

ISCHEMIC STROKE/ TIA REVIEW

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Definitions

- ▣ Definition of TIA and ischemic stroke is based on focal neurologic signs or symptoms referable to known cerebral arterial distributions
- ▣ TIA and stroke represent different ends of an ischemic continuum
- ▣ Historically TIA defined as symptoms < 24 hours
- ▣ MRI positive (DWI) in 30-50% fulfilling that criterion
- ▣ TIA and minor stroke used interchangeably

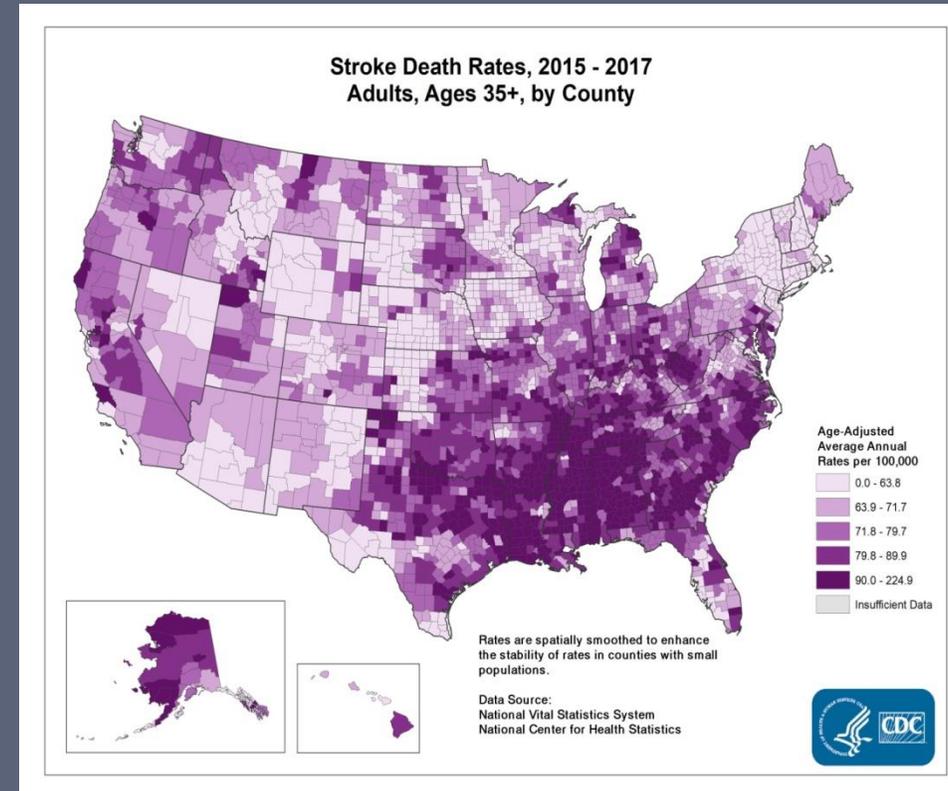
Epidemiology

- ▣ 5th leading cause of death in US
- ▣ stroke rate (Medicare patients over 65) declined 40% from 1988 to 2008
- ▣ Decreased rate of annual recurrent stroke
- ▣ Women have higher lifetime stroke risk and poorer outcomes
- ▣ Stroke risk and stroke related death is highest in black population out of all ethnic groups

Stroke belt

Mortality is 20% higher in the stroke belt, identified as North Carolina, South Carolina, Georgia, Tennessee, Mississippi, Alabama, Louisiana, and Arkansas.

Within the “buckle” - mortality is higher at 40%



Ischemic stroke

- ▣ About 87% of all strokes are ischemic
- ▣ “Time is brain”
- ▣ Optimization of systems to improve the “door to needle” time
- ▣ Early notification of the receiving hospital
- ▣ CT as a first stop
- ▣ Limited laboratory test requirements (glucose only unless on anticoagulation)

ELIGIBILITY – IV tPA

- ▣ “LAST KNOWN WELL” is crucial
- ▣ recent hospitalizations, surgery, trauma, bleeding
- ▣ Anticoagulants? If so need for INR < 1.7
- ▣ BP < 185/110mmHg

NIHSS

- ▣ Reproducible, reliable, rapid evaluation of a patient with acute stroke.
- ▣ Measures consciousness, orientation, visual fields, gaze, language fluency and comprehension, speech, sensory loss and neglect, motor strength, and limb ataxia
- ▣ Initial measure of stroke severity from 0 (no deficits) to 42 (maximum score)
- ▣ No minimum score that would exclude eligibility to receive IV rtPA
- ▣ Posterior strokes notorious for low NIHSS

STROKE MIMICS

- ▣ Seizure
- ▣ Metabolic derangements: hyperglycemia, hypoglycemia, hyponatremia
- ▣ Toxins: alcohol, drugs
- ▣ Migraine with aura
- ▣ Infections from UTI through encephalitis
- ▣ Brain tumor
- ▣ Psychogenic

TREAT?

- ▣ better to err on the side of treatment
- ▣ risk of treating patients with stroke mimics is very low
- ▣ “healthy brains don’t bleed”
- ▣ baseline bleeding risk 1.9 %-6.4 %

TIMING

- ▣ 0-3 hour window
 - increases chances of independence at 3 months by 1/3rd
 - benefits strongest within the first 90 minutes (time dependent)
- ▣ 3-4.5 hour window
 - still not approved by FDA
 - benefit less robust
 - caution in patient >80 years old, with NIHSS >25, h/o diabetes AND stroke, warfarin use

INTERVENTIONAL TREATMENT

- ▣ 6 trials confirmed safety and efficacy in well selected patients
 - age >18 years
 - NIHSS > 6
 - presence of proximal artery occlusion
 - good pre morbid functional status
 - no CT evidence of ischemia
- ▣ Safe- risk of ICH 4.4 %
- ▣ Patients still receive IV tPA
- ▣ Window extended for up to 24 hours

SPECIAL SITUATIONS

- ▣ Patient on NOAC's- IV tPA is contraindicated, mechanical thrombectomy tx of choice
- ▣ Basilar artery occlusion- mechanical thrombectomy up to 24 hours after onset of symptoms
- ▣ Wake up strokes- patient selection based on perfusion studies, DWI MR sequences can identify patients who can be treated safely

ETIOLOGY

- ▣ Thromboembolic
- ▣ Cardioembolic
- ▣ Small vessel
- ▣ Carotid /vertebral artery dissection
- ▣ Cryptogenic
- ESUS (Embolic Stroke of Unknown Source)- looks embolic however lack of evidence during workup

WORKUP

- ▣ Vessel imaging- CTA/ MRA/ carotid US
 - ▣ Cardiac monitoring
 - 30 day cardiac monitor
 - Loop recorder
 - ▣ Echocardiogram- TTE with bubble study
- TEE of limited utility- highly selected patients

COMPLICATIONS

▣ EARLY:

- Hemorrhage- symptomatic 6.4 % of IVtPA patients
- Cerebral edema- 72-96 hours post symptom onset
- Venous thrombosis- 1 st week after stroke

▣ LATE:

- Depression- 30% of stroke survivors- poorer functional outcomes; fluoxetine possibly improves motor function
- Sleep disordered breathing- up to 70% of patients- often undiagnosed preexisting condition

SECONDARY PREVENTION

- ▣ ASA 75-325 mg /day mainstay of therapy
- ▣ ASA/dipyridamole (Aggrenox) – side effects/cost
- ▣ Plavix- not superior to ASA
- ▣ No evidence for switching from ASA to Plavix or otherwise
- ▣ Minor non disabling stroke/ TIA ASA+Plavix for 21 days then ASA only
- ▣ Atrial fibrillation

CHADS2-VASC score

Treat ?- CHADS score

CHA ₂ DS ₂ -VASc for Atrial Fibrillation Stroke Risk		
C ongestive heart failure or left ventricular systolic dysfunction		+1
H ypertension history		+1
A ge ≥ 75 years		+2
D iabetes history		+1
S 2stroke, TIA, Thromboembolism history		+2
V ascular disease history		+1
A ge 65-74 years		+1
S ex category (female)		+1
Score	Rate of Thromboembolic Event (per year)	
0	1.9%	Low
1	2.8%	Moderate
2	4%	Moderate
3	5.9%	High
4	8.5%	High
5	12.5%	High
6	18.2%	High
Score	Risk	Anticoagulation Therapy Considerations
0	Low	None recommended or clinical judgement
1	Low-moderate	Consider antiplatelet or anticoagulation
≥ 2	Moderate-high	Anticoagulation candidate

SECONDARY PREVENTION

- ▣ HTN- goal <140/90 mm Hg in patients with an ischemic stroke, <130/80 mm Hg if small vessel etiology
- ▣ DM- HbA1c < 7 mg%
- ▣ LIPIDS- high intensity statin/ goal LDL < 70 mg%
- ▣ Smoking
- ▣ Exercise- 3-4 sessions of moderate- to vigorous-intensity aerobic exercise per week (40 minutes)
- ▣ Diet- Mediterranean diet, DASH diet

Carotid stenosis

- ▣ early (within 2 weeks) carotid revascularization for SYMPTOMATIC > 50% stenosis
- ▣ CEA superior to stenting for patients > 70 yo
- ▣ CAS for patients with contralateral occlusion, h/o CEA, h/o neck irradiation, high cardiovascular risks
- ▣ old data suggest benefit of CEA for ASYMPTOMATIC high grade stenosis- no recent validation or comparison of stenting versus surgery or medical therapy

PRIMARY PREVENTION

- ▣ Prevention of childhood obesity
- ▣ Life's simple 7 promoted by American Heart Association can lead to 70-80% lower chance of stroke
- ▣ Oral contraceptives increase by 1.7-2.0 especially for women with migraine with aura (associated with estrogen dose)
- ▣ Earlier menopause- increased risk especially < 40yo (HRT not recommended beyond 10 years post menopause)

TIA

- ▣ transient neurological deficits related to hypoperfusion in a limited area of the brain
- ▣ 10 % of patients with TIA will have a stroke within 90 days (highest risk 24 hours)
- ▣ definition based on imaging findings no longer on duration (<24 hours)
- ▣ used interchangeably with minor stroke
- ▣ motor and speech symptoms- greater likelihood of brain ischemia

NOT SUGGESTIVE OF ISCHEMIA

NONFOCAL SYMPTOMS:

- generalized weakness
- dizziness/lightheadedness
- bilateral symptoms- eg. hand tingling/ numbness

ONSET: gradual, progressive

RECURRENT: repeated stereotypical symptoms

Admit?- ABCD2 score

The ABCD² Rule

Risk Factor	Points
Age > 60 years	1
Initial BP > 140/90	1
Unilateral Weakness	2
Speech Impairment without Weakness	1
Symptom Duration 10-59 minutes	1
Symptom Duration > 60 minutes	2
History of diabetes	1

Low risk = 0-3 | Moderate risk = 4-5 | High risk ≥ 6

What now?

- ▣ Workup and treatment the same as for stroke

QUESTIONS?

