TIA: Transient Ischemic Attack

Key points:
1. TIA is a serious warning sign for potential stroke, death, cardiovascular event, or recurrent TIA.
2. After TIA, 10% of patients have strokes and half of these occur in the first two days.
3. Risk stratification based on validated independent risk factors can help with triage and treatment decision making.

Classic Definition: A syndrome where sudden onset of focal or global neurologic symptoms last < 24 hours and is attributable to a transient decrease in blood supply (i.e. no apparent non-vascular cause).

Three pathophysiologic subtypes:
1. Large artery TIA- low flow (i.e. carotid stenosis or other proximal stenosis)
2. Embolic TIA- artery to artery (extra or intracranial source), cardioaortic or unknown source
3. Lacunar or small vessel TIA

- Clues to distinguish between large artery and embolic TIA: Precise H & P is the most useful tool.
  - Large artery/low flow TIAs: tend to be brief (min-hours) and recurrent
  - Embolic TIAs tend to be single, prolonged episodes (hours +)

One study divided patients with TIAs into < 60 minutes and > 60 minutes in duration: Those with TIAs > 60 min had an 86% chance of having an embolic TIA vs. 46% in the < 60 minute group.

Differential Diagnosis:
Consider other neurologic, infectious, malignant, hematologic, and metabolic etiologies of symptoms including but not limited to: hypoglycemia, hyponatremia, hyperviscosity syndrome, migraine, seizure, syncope, psychiatric, thrombocytosis, tumor, dissection, bleed (SDH, Epidural hematoma), vasculitis, medication effect, toxins/drugs, etc.

If no obvious non-vascular cause of TIA, proceed with urgent TIA workup.

Evaluation:
Findings consistent with TIA deserve urgent work up due to the risk of significant morbidity. The largest study to date (N=1707) described by Johnson (JAMA) evaluated the short term prognosis for patients presenting to emergency departments with TIA syndromes and found the following:
1. Within 90 days, approx 10% of patients had a stroke. Half of these strokes occurred within two days of the initial TIA.
2. Within 90 days, patients had a combined risk of 25% for stroke or other adverse outcome including cardiovascular events, TIA, death. (2.6% cardiovascular events, 2.6% deaths, and 12.7% recurrent TIAs)

Who is most at risk? (Affects triage; admit, anticoagulate vs. ED work-up/ possible discharge)
The JAMA study evaluated the risk factors most associated with stroke in the first 90 days after a TIA. They identified the following five features as independent risk factors for stroke:
- Age >60
- Duration of TIA > 10min
- Diabetes
- Involvement of speech difficulty
- Symptom or sign of weakness

- The risk of stroke in the first 90 days after TIA for these patients is as follows:
  One RF=3% risk  Two RF=7% risk  Three RF=11% risk
  Four RF=15% risk  Five RF=34% risk

Work up of TIA:
- Urgent evaluation and treatment is warranted given the short-term risk of significant morbidity and mortality. Some lower risk patients may be able to receive an adequate work up in the ED if this can be coordinated.
• Risk stratification helps identify those patients who are at highest risk of adverse outcomes and who likely should be admitted, anticoagulated, and receive an expedited work-up.

• Work up-should include:
  o Evaluation of carotids (MRA, CTA extending to the arch, Doppler US with TCD, or conventional angiography)
  o Echocardiogram with bubble study: TEE best evaluates left atrial appendage, PFO, and large vessel/aortic disease, but TTE is adequate to visualize LV thrombus & function. In one report of 79 pts with cryptogenic stroke, TEE revealed a potential embolic source in 57% of pts compared with only 15% by TTE.3
  o Basic lab work including CBC and coags, D-stick, Chem 7, lipids, hypercoagulable work-up (esp if pt is < 50 with no other reason for TIA)
  o EKG, telemetry to rule out paroxysmal atrial fibrillation.

**Treatment:** in consultation with neurology, anticoagulation with heparin and aspirin are warranted if there are no contraindications. Risk factor modification is essential. The decision to hospitalize is often based on the patient’s risk of stroke as assessed by the model above.

References: