Diagnosis and Management of Transient Ischemic Attack

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Objectives

Session will help understand:

• Diagnosis and investigation of TIA
• Common causes of TIA
• Differential diagnosis of TIA
• Management of TIA, including when a TIA patient should be admitted
Definition - Old vs New

- Historically time-based definition
  - “Full resolution of symptoms within 24 hours”
  - However 30% to 50% of patients fulfilling time-based definition have ischemic lesions on DWI MRI

- New definition
  - “Transient episode of neurologic dysfunction caused by focal brain, nerve or retinal ischemia without infarction”
Ischemic lesion or TIA?

A 57 year old man presented with a 2 minute episode of left hand weakness. During the episode, his left hand became unusable and he could not pick anything up. He was able to lift his arm, although it felt weak. He was able to walk and talk normally throughout the episode.

On presentation to the emergency department, he was completely back to normal. Head CT and CT angiogram were normal. However, the diffusion-weighted MRI showed a small lesion in the right hemisphere consistent with his symptoms.
For practical purposes...

The workup and treatment measures including secondary prevention following TIA and small ischemic stroke are similar.
Importance of identification of ischemia

• 20% of patients with ischemic stroke present with a TIA within hours to days preceding stroke

• 80% of strokes after TIA are preventable
Diagnosing TIA

- TIA is a clinical syndrome where diagnosis is largely dependent on accurate history.
- Are symptoms:
  - Focal or generalized?
  - Sudden or gradual onset?
  - New onset or recurrent stereotyped?
60% of patients referred to a TIA clinic will not have a final diagnosis of TIA

TIA mimics:
- Seizures- Todd’s Palsy
- Migraines- hemiplegic migraine, atypical migraine
- Demyelination disorders
- Structural lesions (tumor, subdural/epidural)
- TGA
- Syncope
- Nerve compression
- Vestibulopathies
- Metabolic encephalopathies
Workup - what’s the hurry?

- 10% of patients presenting with TIA or minor strokes will have a stroke within the next 90 days
- Highest risk period during the first 24 hours
Risk Stratification after TIA

ABCD

A. Age > 60 : 1
B. BP>140/90 : 1
C. Clinical Features
   Motor weakness: 2
   Speech alone: 1
D. Duration
   >10-59 min: 1
   >60 min: 2
D². Diabetes: 1
### Risk Stratification after TIA

Estimated two-day stroke risk based on ABCD² score:

<table>
<thead>
<tr>
<th>Score</th>
<th>2 day Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-7</td>
<td>8%</td>
</tr>
<tr>
<td>4-5</td>
<td>4%</td>
</tr>
<tr>
<td>0-3</td>
<td>1%</td>
</tr>
</tbody>
</table>
Reasonable to hospitalize if:

- ABCD² score is $\geq 3$
- ABCD² score is 0-2 and uncertainty if diagnostic workup can be completed in 2 days as outpatient
Limitations of ABCD$^2$

ABCD$^2$ score could still be 0-2 while there is evidence:

- Event was caused by focal ischemia such as abnormal CT/CTA showing > 50% stenosis in symptomatic vessel
- Asymptomatic Carotid Stenosis >70%
- New onset atrial fibrillation
A 50-year-old man presented to the emergency department with an episode of left hemiplegia that lasted 5 minutes. He smoked cigarettes but otherwise had no significant past medical history.

His examination was normal, with blood pressure of 125/75 mm Hg and an ABCD² (age, blood pressure, clinical features, duration, presence of diabetes mellitus) score of 2. Head CT was normal, but CT angiography showed a high-grade stenosis of the right internal carotid artery.
Diagnostic Workup

- CBC, Chemistry, PT/PTT, INR
- Lipid profile
- EKG
- CT vs MRI, CTA vs MRA
- Conventional angiography
- Carotid duplex ultrasound, Transcranial Doppler
- Echocardiogram TTE, TEE
- Ambulatory cardiac monitoring
- Additional considerations:
  - Hypercoagulable states, arteritis, dissection, vasospasm, drug abuse
- Cryptogenic stroke/ TIA: 30-40 %
Treatment

- Revascularization
- Anticoagulation
- Antiplatelets
- Manage
  - Hypertension
  - Diabetes Mellitus
  - Hyperlipidemia
- Lifestyle interventions
  - Smoking
  - Obesity
Algorithm 1

Evaluation of patient presenting with acute symptoms of possible TIA or minor ischemic stroke

- Acute symptoms of possible TIA or minor, nondisabling ischemic stroke
  - Initial assessment (history, examination, ECG) to determine likelihood cause is ischemic
    - Consider possible stroke or TIA mimics eg,
      - Seizure
      - Migraine aura
      - Syncope
      - Transient global amnesia
      - CNS demyelinating disease
      - Peripheral vestibulopathy
      - Metabolic disorder
      - Others
  - Possible or probable TIA or minor stroke
    - Symptoms resolved or ongoing but nondisabling
      - Urgent evaluation:
        - Brain imaging with MRI (preferable) or CT, if not already done
        - Neurovascular imaging (MRA, CTA, CDUS, and/or TCD) to identify large artery cause
        - Cardiac evaluation (prolonged rhythm monitoring, echocardiography) to identify cardioembolic source
        - Laboratory testing to rule out metabolic and hematologic causes of neurologic symptoms
      - TIA or minor, nondisabling ischemic stroke
        - Begin appropriate secondary stroke prevention treatment
  - Symptoms ongoing and potentially disabling
    - Emergent evaluation for IV thrombolysis and/or mechanical thrombectomy
      - Stroke mimic or other cause determined
      - Manage as appropriate
  - Definite mimic of TIA or stroke
    - Manage as appropriate
Algorithm - 2

Acute symptoms of possible TIA or minor, nondisabling ischemic stroke

Initial assessment (history, examination, ECG) to determine likelihood cause is ischemic

Consider possible stroke or TIA mimics eg, - Seizure - Migraine aura - Syncope - Transient global amnesia - CNS demyelinating disease - Peripheral vestibulopathy - Metabolic disorder - Others

Possible or probable TIA or minor stroke

Definite mimic of TIA or stroke

Manage as appropriate
Algorithm- 3

Possible or probable TIA or minor stroke

Symptoms resolved or ongoing but nondisabling

Urgent evaluation:
- Brain imaging with MRI (preferable) or CT, if not already done
- Neurovascular imaging (MRA, CTA, CDUS, and/or TCD) to identify large artery cause
- Cardiac evaluation (prolonged rhythm monitoring, echocardiography) to identify cardioembolic source
- Laboratory testing to rule out metabolic and hematologic causes of neurologic symptoms

Symptoms ongoing and potentially disabling

Emergent evaluation for IV thrombolysis and/or mechanical thrombectomy*
Algorithm - 4

Urgent evaluation:
- Brain imaging with MRI (preferable) or CT, if not already done
- Neurovascular imaging (MRA, CTA, CDUS, and/or TCD) to identify large artery cause
- Cardiac evaluation (prolonged rhythm monitoring, echocardiography) to identify cardioembolic source
- Laboratory testing to rule out metabolic and hematologic causes of neurologic symptoms

TIA or minor, non-disabling ischemic stroke

Begin appropriate secondary stroke prevention treatment

Stroke mimic or other cause determined

Manage as appropriate
Thank You
Questions?