Stroke and TIA mimics

Putting the latest evidence based medicine into practice.

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Why worry? 10% early stroke risk after TIA.

- 70,000 TIAs annually in UK.
- Up to 20% will have a stroke within 90 days.
- Of those, 50% will have a stroke within 2 days.
- Guidelines on whom to admit are vague.
- Practice is variable.

Lancet 2005; 366: 29-36
TIA - use the Rothwell ABCD score to stratify risk of progression to ischaemic stroke.

Simple clinical observations.

Composite score is highly predictive of 7 day risk of stroke.

If high risk (5 or more): admit.

Rothwell score: ABCD2

A - Age 60 or older: 1 point
B - BP > 140/90: 1 point
C - Clinical features
   unilateral weakness: 2 points
   speech impairment: 1 point
D - Duration
   ≥60 minutes: 2 points
   10-59 minutes: 1 point
   < 10 minutes: 0 points

The hyperacute context

Brain Attack -> CT Brain -> ICH

Paramedic FAST -> Stroke Mimic

GP

SAH

TIA

Secondary Prevention

Acute Stroke

Thrombolysis
Is ROSIER a better stroke assessment in the ER?

<table>
<thead>
<tr>
<th></th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROSIER</td>
<td>93%</td>
<td>83%</td>
</tr>
<tr>
<td>FAST</td>
<td>82%</td>
<td>83%</td>
</tr>
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</table>

Total score: -2 to +5

Admit to Acute Stroke Unit/ refer to Stroke team if total score >0.

Mohd Nov et al, Lancet Neurology 2005
How often is “suspected stroke” not stroke?

- Meta-analysis of 24 heterogeneous studies, mean size 388 patients.
- 22% (95% CI) are mimics.
- According to context:
  - Ambulance 34%
  - A&E 30%
  - Stroke Unit 11%
TIA / Stroke mimics

Metabolic/toxic/infections
  Sepsis / intercurrent illness
  Hypo-/hyper- gly/ Na/ Ca

Ophthalmic
  Glaucoma
  Retinal vein occlusion

Respiratory
  Hypoventilation

Other
  Syncope
  Postural hypotension
  Vestibular attack
Neurological

- Seizure
- Tumour
- Spreading migraine aura
- Somatisation / functional / panic
- Neuropathies (cervical spond, compression)
- Radiculopathies
- Haematomas
- TGA
- Bell’s palsy
- Multiple sclerosis
- Myasthenia gravis

*Imaging helpful for diagnosis.
Neurovascular clinic perspective

IRH:

Stroke and TIA  ?%
Eye TIAs       ?%
Possible CVD   ?%
Mimics         ?%

Patients seen in our NV clinic
Front door perspective:

Stroke and TIA 67%
Possible CVD 14%
Mimics 19%

Stroke 2006; 37(3):769-75
Top 5 TIA / Stroke mimics:

- Seizure
- Sepsis / intercurrent illness
- Syncope
- Spreading migraine aura
- Somatisation / functional / panic
TIA

A clinical syndrome characterised by
- a sudden onset of focal cerebral or monocular function
- with symptoms lasting < 24hr
- thought to be due to inadequate cerebral or ocular blood supply
- as a result of low blood flow, thrombosis or embolism
  associated with disease of the arteries, heart or blood.

A clinical syndrome characterised by:

- a sudden loss of focal cerebral function
- with symptoms that are fatal or last >24h
- thought to be due to other spontaneous brain haemorrhage or inadequate cerebral blood supply to a part of the brain (ischaemic stroke)
- As a result of low blood flow, thrombosis or embolism
  associated with disease of the arteries, heart or blood.

“Sudden” onset of vascular events

Sudden
- without warning
- maximal at onset
- body parts affected simultaneously

“What were you doing at the time?”

“What was it like at its worst?”

“What was it like at the beginning or did it take some time?”
Focal symptoms to beware of:

- “Positive” rather than “negative” symptoms

Isolated focal symptoms:

- Motor symptoms
- Simultaneous bilateral weakness
- Imbalance
- Slurred speech
- Double vision
- Vertigo
- Forgetfulness
Front door perspective: brain attack

Sudden onset
Weakness face/arm/leg
Slurred speech
Able to walk
Dizziness
Seizure
LOC
Confusion

Stroke 2006; 37: 769-75
Lancet 2005; 4:727-34
Transient focal neurological attacks

- Ischaemia
- Seizure (focal)
- Spreading aura of migraine
- Somatisation
- Intracranial tumour, subdural, abscess
- Multiple sclerosis
- Mononeuropathy / radiculopathy
Transient non-focal neurological attacks

- Generalised seizure
- Syncope
- Somatisation
- Vestibular failure (Ménière's disease)
- TGA
- Metabolic disturbance
Migraine aura ± headache

- Positive symptoms
- Spread and intensify 5-20 min
- Gradually fade < 60 min
- Headache 4-72 hours
- PMH of migraine
Focal seizures

- Positive symptoms
- Spread over seconds lasting a few min
- ± residual negative symptoms / signs, amnesia
- ± preceding aura

- Speech: arrest / dysphasia / dysarthria
- 2% of strokes + seizure
### Shouldn’t we do an MRI on everyone?

**Brain imaging**

<table>
<thead>
<tr>
<th></th>
<th>CT</th>
<th>CT Ang/perf</th>
<th>MR dwi/pwi/MRA</th>
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<tbody>
<tr>
<td><strong>Availability</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urgent</td>
<td>Easy(ish)</td>
<td>Variable</td>
<td>Challenging</td>
</tr>
<tr>
<td>Routine</td>
<td>Easy</td>
<td>Poor</td>
<td>Variable</td>
</tr>
<tr>
<td>Cost</td>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sensitivity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemorrhage</td>
<td>High</td>
<td>N/A</td>
<td>Excellent</td>
</tr>
<tr>
<td>Acute infarction</td>
<td>Poor</td>
<td>Very good</td>
<td>Excellent</td>
</tr>
<tr>
<td>Salvageable time</td>
<td>Poor</td>
<td>Excellent</td>
<td>Excellent</td>
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<tr>
<td><strong>Tolerability</strong></td>
<td>High</td>
<td>High</td>
<td>Problematic in some</td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td><strong>Technical support</strong></td>
<td>Low</td>
<td>High</td>
<td>Moderate</td>
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How we handle TIAs / Stroke

Triage and treat

Telephone discussion:

1. Immediate admission for ?thrombolysis
2. Immediate admission
3. Assess in A&E same day
4. See in next TIA clinic
5. Divert to more appropriate service
Messages

- History: onset and progression
- Positive / negative symptoms
- Isolated symptoms
- Dizziness, LOC, confusion
- False positive imaging findings
- It’s difficult to be accurate very early / late.