High Risk TIA
Management and Prognosis

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Disclosure

- I have no relevant financial interest, arrangements or affiliation with any of the products mentioned during this presentation.
- In relation to this presentation there are no conflicting interests to disclose.
• In 1869 wrote a letter to W.H. Willis MD, mentioning difficulties speaking and moving “foot”

• March 21st 1870 describes to his friend John Forester: “... not been able to read all the way, more than the right hand half of the names over the shops.”

• The novelist Charles Dickens died of a stroke on June 9th 1870 at age of 58 years
TIA

- a) Definition
  b) Risk stratification
  c) Acute decision making-management
  d) Prognosis
Definition

TIA is a brief episode of neurological dysfunction caused by focal brain or retinal ischemia, with complete resolution of symptoms without evidence of infarction.

NEJM. 2002; 347:1013-1016
<table>
<thead>
<tr>
<th>Old Definition</th>
<th>New Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Based</td>
<td>Tissue Based</td>
</tr>
<tr>
<td>Deficit $\leq 24$ hours.</td>
<td>Transient, without evidence of infarction</td>
</tr>
<tr>
<td>Suggests Benign</td>
<td>Indicates potential ischemic danger.</td>
</tr>
<tr>
<td>Delays Intervention</td>
<td>Encourage IMAGING and intervention</td>
</tr>
<tr>
<td>Inaccurately predicts ischemia.</td>
<td>Good ischemic predictor</td>
</tr>
<tr>
<td>Diverges from CAD</td>
<td>Consistent with CAD</td>
</tr>
</tbody>
</table>
Diffusion MRI in patients with TIA

Stroke 1999;30:1174
TIA

- a) Definition
  
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d) Prognosis
The Northern California TIA Study
JAMA.2000:13;284(22):2901-6 Cohort study

- 16 Hospitals in California
- Time span: March 1997- Feb 1998
- Diagnosis of TIA in ER with follow up in 3 months time
  - 1707 Patients
  - Average age 72 years
  - Average event duration 70 min
- 3 months: risk of stroke...... 10.5%
- 1 week:  risk of stroke........ 6.0%
- Recurrent TIA.................. 13.2%
- Death.................................. 2.6%
- **Total** ......................... **23.5%**
50% of all strokes happen in the first 2 days after TIA

Fig. 2: Early risk of stroke after discharge from the emergency department among patients with a first-ever TIA (n = 167). Note that half of the cases of stroke occurring within 3 months happened in the first 2 days after TIA.

JAMA 2000;284:2901-2906
Quoted Risk of stroke after TIA

- Whisnant, et al: 10.0%/90d
- Johnston, et al: 10.5%/90d
- Johnston, et al (Kaiser C): 8.4%/90d
- Eliazsew (NASCET): 20.1%/90d
- Panagos, et al: 13.3%/90d
- FASTER (CANADA): 8.9%/90d
- Lovett, (Oxfordshire): 12.0%/30d

- Average: 12%
Facts from NASCET trial

**NASCET Freedom From Ipsilateral Stroke - Medical Group**
(Time 0 = Date of Index HTIA vs RTIA)

- 4.6% (Index TIA)
- 12.4% (Retinal)
- Hemispheric

Percentages are Kaplan-Meier risk estimates at 14 days.

Months After Date of Index TIA
### ABCD2

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>AGE</strong></td>
<td>&gt; 60 years</td>
<td>1 point</td>
</tr>
<tr>
<td><strong>BLOOD PRESSURE</strong></td>
<td>sBP &gt; 140 or dBP &gt; 90</td>
<td>1 point</td>
</tr>
<tr>
<td><strong>CLINICAL FEATURE</strong></td>
<td>unilateral weakness</td>
<td>2 points</td>
</tr>
<tr>
<td></td>
<td>aphasia no weakness</td>
<td>1 point</td>
</tr>
<tr>
<td><strong>DURATION</strong></td>
<td>&gt; 60 min</td>
<td>2 points</td>
</tr>
<tr>
<td></td>
<td>&gt; 10-59 min</td>
<td>1 points</td>
</tr>
</tbody>
</table>

**2-day** stroke risk: 1% (0-3 points), 4% (4-5 points), 8% (6-7 points)

**90 day** stroke risk up to 25%

Lancet 2007; 369:283-92
ABCD2 + MRI (DWI)

Summary risks

- TIA patients have high risk of stroke within 3 months (12 %)

- Most patients with TIA have a stroke within first week after event

- The risk of re-occurrence is different if they have hemispheric or retinal symptoms
TIA

- a) Definition
- b) Risk stratification
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• 23% of patients with ischemic stroke had a TIA before their stroke

a) 17% occur the same day
b) 9% occurred the previous day
c) 43% had a TIA within 1 week
Endarterectomy Timing

The NASCET and ECST Study results,
Lancet 2004;363:915-24

5-year Absolute Risk Reduction in stroke (%)

Time from event to randomization (weeks)

NNT=3

NNT=7

70 to 99% stenosis
50 to 69% stenosis

0-2: 30.2
2-4: 14.8
4-12: 17.6
>12: 11.4

3.3
4
8.9
-2.9

NNT=3
NNT=7
Atrial fibrillation

- One of the strongest known independent risk factor for ischemic stroke.
- Valvular and non-valvular disease
- Permanent vs. paroxysmal
- High risk patient
  Annual risk up to 12%
- Anticoagulation is standard of care
Hypertension

- The most important modifiable risk factor
  Ischemic bleeding,
  Silent strokes

- Contributes to
  Large vessel disease
  Small vessel (lacunar)
  LV dysfunction

- Treatment **Risk reduction 40%**

- CHEP recommendations:
  - <140/90 (in DM <130/80)
3-Month Stroke Risk

Lovett et al. Neurology 2004: Meta analysis, n=1709
TIA

- a) Definition
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90 days stroke risk from 10% to 2%

Figure 2: Risk of recurrent stroke after first seeking medical attention in all patients with TIA or stroke who were referred to the study clinic.

EXPRESS Study
Rothwell et al. Lancet 2007
RECOMMENDATIONS

The ‘Don’t and Ifs’ rules

- Don’t discharge If not sure; consult IM/Neurologist!
- Don’t discharge a patient unless major risk factors addressed and images have been done. (managing hypertension, hyperglycemia, electrolytes imbalance) and CT of brain and carotid images

If moderate to severe stenosis urgent referral to vascular surgery

- Don’t discharge a patient with crescendo TIAs
- Don’t discharge a patient with mild deficits (it is a stroke)
- Don’t discharge a patient with atrial fibrillation with out treatment.
RECOMMENDATIONS

The ‘Don’t and Ifs’ rules

• If ABCD2 score is 0-3 points and patient is stable;
  • REFERRAL TO STROKE CLINIC
    (all patients should be seen within 3 days)

• If large vessel disease is suspected: load patient with Clopidogrel (75mg x 3).

• If Patient is in Atrial Fibrillation: Patient should be admitted on IV heparin and a (transesophageal) echo should be requested to rule out: Atrial appendage thrombus (by best evidence practice)
References:

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- Gladstone et al. CMAJ 2004
- Lancet 2007; 369: 283-92
- ppt slides, Arturo Tamayo MD, FAHA, Assistant Professor of Neurology U of M
- Pooled analysis from population and RCTs (OXCASC, OCSP, UK-TIA and ECST) Rothwell & Warlow, Neurology 2005; 64: 817
- L. Saver MD, Stroke 1999; 30: 1174
- Stroke. 2006; 37: 577-617