Systems of Stroke Care to Enhance Outcomes

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Disclosures

Consultant / Speaker’s Bureau:
Medtronic
Penumbra
Pulsar
Stryker
Southeast Regional Stroke Center at Erlanger

Center of Excellence
Chattanooga Network for Stroke
Southeast Regional Stroke Center

Over 75 hospitals in a 55,000 sq mile encatchment area
Endovascular Therapy after Intravenous t-PA versus t-PA Alone for Stroke

Abstract

The safety and tolerability of endovascular therapy with intravenous tissue plasminogen activator (t-PA) in patients with acute ischemic stroke was assessed in the IMS III (Interventional Management of Stroke III) trial. The primary end point was a composite of death, dependency, or death due to intracranial hemorrhage within 90 days of randomization.

Methods

A randomized, open-label, clinical trial was conducted in 19 countries involving 1200 patients with acute ischemic stroke. Patients were randomized in a 1:1:1 ratio to receive intravenous t-PA alone, intravenous t-PA followed by intravenous urokinase (IA t-PA/U), or IA urokinase alone. The primary end point was the composite of death, dependency, or death due to intracranial hemorrhage within 90 days of randomization.

Results

The primary end point occurred in 65.4% of patients in the IA t-PA/U group, 63.5% in the intravenous t-PA group, and 64.3% in the IA urokinase group (p = 0.75). The incidence of death due to intracranial hemorrhage was 3.4% in the IA t-PA/U group, 3.5% in the intravenous t-PA group, and 4.4% in the IA urokinase group (p = 0.63). The incidence of death or dependency was 30.3% in the IA t-PA/U group, 28.6% in the intravenous t-PA group, and 30.0% in the IA urokinase group (p = 0.75).

Conclusions

Endovascular therapy with intravenous t-PA in patients with acute ischemic stroke is safe and effective, with a similar incidence of death due to intracranial hemorrhage compared to intravenous t-PA alone.
IMS III trial suffered from a dramatic delay between the initiation of IV tPA and endovascular therapy.
IMS III: Time to Treatment

IMS III

- Onset to arrival: 57 min
- Arrival to IV tPA: 66 min
- IV to groin puncture: 86 min
- Groin puncture to IA: 44 min

130 min between IV tPA and start of IA therapy
Time is Brain

- The single biggest factor is Reperfusion of the brain
Each 30 minutes = 10% loss!

(Khatri, Neurology, 2009)
Organization of Stroke Care in Tennessee
1. Officers – The Chair and Vice-Chair will be elected by the Council every 3 years

2. Structure – The Council will meet at least two (2) times per year. The Council will establish sub-committees as they see fit to accomplish their mission/goals. The Chair will submit a report to the Department of Health after each meeting.

3. Mission – The mission of the Council is to develop and maintain a Statewide Stroke Care System Plan for Tennessee.
Tennessee Stroke Care Advisory Council

4. Composition – Core membership to include: one (1) Medical Director, or their designee, from all Certified Comprehensive Stroke Centers, one (1) Medical Director, or their designee, from a Certified Primary Stroke Center, one (1) Medical Director, or their designee, from a Certified Acute Stroke Ready Hospital, one (1) Medical Director, or their designee, from a Rehabilitation Center, one (1) Pediatric Neurologist, one (1) Hospital Administrator from a Certified Stroke Center, one (1) Comprehensive Stroke Center Stroke Coordinator, one (1) TMA Representative, one (1) EMS Board member, and one (1) consumer.
Tennessee Stroke Care Advisory Council

Sub-committees:

1. EMS

2. Registry

3. Stroke Certification - Formulate proposal to AHA and State on destination protocols that indicate what’s best for the patient. It was recommended a survey be developed to determine the capabilities of hospitals within our state (IV tPA, CT, Etc).
Tennessee Stroke Bill- AHA

AN ACT to amend Tennessee Code Annotated, Title 68, relative to the establishment of a statewide stroke system of care.

“(c) The department shall recognize as many accredited acute care hospitals as comprehensive stroke centers as apply and are certified as a comprehensive stroke center by a council-approved nationally recognized guidelines-based organization that provides comprehensive stroke center hospital certification for stroke care; provided, that each applicant continues to maintain its certification.”
OUR LOVE CAN NEVER BE
SNIS- Standards and Guidelines

PREHOSPITAL CARE DELIVERY AND TRIAGE OF STROKE WITH EMERGENT LARGE VESSEL OCCLUSION (ELVO): REPORT OF THE STANDARDS AND GUIDELINES COMMITTEE OF THE SOCIETY OF NEUROINTERVENTIONAL SURGERY.
Stroke Assessment Screening Tools

- FAST
- Cincinnati Prehospital Stroke Scale
- L.A. Motor Scale (LAMS)
- NIH Stroke Scale (NIHSS)
- Rapid Arterial Occlusion Evaluation (RACE) Scale
- 3-Item Stroke Scale
CT Perfusion Study
What is RAPID?

• RAPID is a medical image software package that provides viewing, processing and analysis of diffusion and perfusion MRI scans and CT perfusion scans.

• RAPID is easy to use.

• Results are available a few minutes after RAPID receives the data.

• RAPID outputs brain image maps to DICOM devices, such as the hospital PACS. Images can be sent by email to research team.
Minimum Brain Coverage

- 8 cm minimum coverage
- Many CT scanners will require 2 adjacent (non-overlapping) slabs
- Core volume from each slab must be added to determine total core volume
RAPID outputs MRI

Mismatch map: directly compare volumes of DWI and critical hypoperfusion

<table>
<thead>
<tr>
<th>DWI lesion: 10 ccm</th>
<th>PWI (Tmax&gt;6s) lesion: 76 ccm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mismatch ratio: 7.9</td>
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Infarct core = DWI lesion with ADC < 615
RAPID outputs CTP

Mismatch map: directly compare volumes of infarct core & critical hypoperfusion

Infarct core = tissue with >70% reduction in CBF
Be Creative