

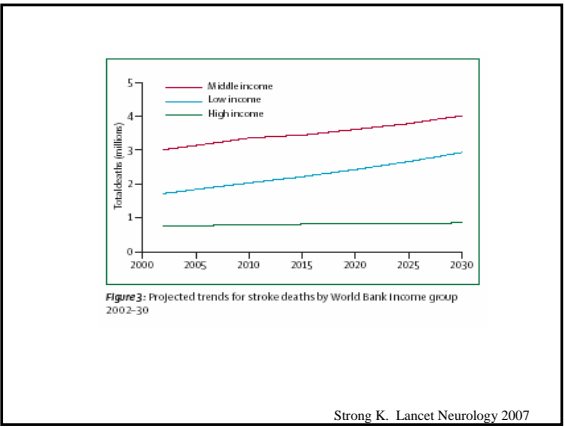
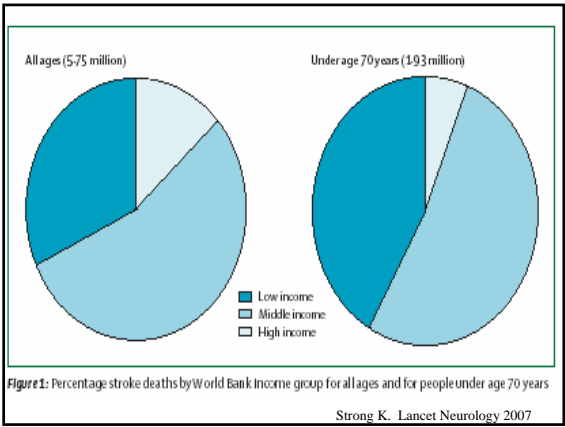
**FERNE / MEMC IV Neurological Emergencies Track:
Stroke Management in Developing Countries
Junaid A. Razzak PhD, MD, FACEP**

**Stroke Management in
Developing Countries**

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4 out of 5 strokes in the world
occur in developing countries

Mathers CD et al. Global Burden of Disease, 2006



Stroke is not always the same
disease in low income
countries

| | Stroke pathology | Geographic distribution |
|------------------------------|---|---|
| Infectious causes | | |
| Neurocysticercosis | Cerebral infarcts | Central and South America, sub-Saharan Africa, Asia |
| Chagas' disease | Cardioembolic infarcts | Central and South America |
| Cerebral malaria | Parenchymal haemorrhages, cerebral infarcts | Central and South America, Asia, Africa |
| Tuberculosis | Cerebral infarcts | Worldwide |
| Viral haemorrhagic fevers | Parenchymal and subarachnoid haemorrhages | South America, Asia, sub-Saharan Africa |
| Leptospirosis | Parenchymal and subarachnoid haemorrhages | Asia, Central and South America |
| Infective endocarditis | Cardioembolic infarcts, parenchymal and subarachnoid haemorrhages | Worldwide |
| Non-infectious causes | | |
| Sickle cell disease | Cerebral infarcts, parenchymal haemorrhages | Africa, Central and South America |
| Snake bites | Cerebral infarcts, parenchymal haemorrhages | Worldwide |
| Cerebral venous thrombosis | Haemorrhagic cerebral infarcts | Asia, Central and South America |

Table 3: Causes of stroke specific to developing countries*

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Treatment options are limited
or different



Intravenous Thrombolysis

- tPA is not an approved drug in Pakistan
- It is however available to those who can afford it; at 30 times the average monthly income.
- For most people in developing countries this drug is not going to be available/affordable for the foreseeable future

Neuro-Imaging

- Available in large centers
 - 3-4 tPA a month at AKU
- If patient can afford, it is much easier to get an MRI in Pakistan than in US
- But in acute setting with fee for service, even if patient makes it in time, they will likely not carry enough money to get a CT or MRI right away

Other Interventions

- Intra-arterial thrombolysis
 - Available at our center
- Merci Device
 - Very expensive (3 times that of tPA); not used in Pakistan
- Ultrasound
 - Not used in our center

Stroke Care
Small Success = Large Gains

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“If there were a 2% reduction per annum in stroke mortality (due to better management), this would result in 6.4 million fewer deaths from stroke between 2005 and 2015, with most deaths averted and years of life gained in low and middle-income countries.”

So What can be done?

**Focus on Inexpensive Interventions
and System Improvement**

Early aspirin treatment for ischemic stroke reduces death or dependency by 12 people per 1000 treated, and coordinated care in stroke units by 56 per 1000 receiving such treatment.

Focus on Prevention

Over 60% of stroke mortality in low-income and middle-income countries, as well as high-income countries, is attributable to a few modifiable risks. In particular, high blood pressure causes an estimated 54% of stroke mortality in low-income and middle-income countries, followed by high serum cholesterol (15%) and tobacco smoking (12%).

Summary

- Stroke is a major public health problem in developing countries
- Diagnostic and therapeutic options are available in some places but availability is not consistent
- Focusing on simpler therapeutic and preventive strategies have a major chance of success

Thank You



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Cost – Is it a real issue?

- Two Health Systems
- Public System would not be able to afford newer modalities for a long time to come

Human Resources

- Number of Health Care Providers
- High Level Expertise

Health System Challenges

- Referral Networks
- Prehospital Care
- Emergency Care System
- Hospital System

| | |
|-----------|--|
| Detection | Recognition of stroke signs and symptoms |
| Dispatch | Call 9-1-1 and priority EMS dispatch |
| Delivery | Prompt transport and prehospital notification to hospital |
| Door | Immediate ED triage |
| Data | ED evaluation, prompt laboratory studies, and CT imaging |
| Decision | Diagnosis and decision about appropriate therapy |
| Drug | Administration of appropriate drugs or other interventions |

At least 80% of all cardiovascular disease and type 2 diabetes and over 40% of cancer could be avoided through a healthy diet, regular physical activity and avoidance of tobacco use

- Death from Stroke in developing countries (low and middle income countries) accounted for 85.5% of stroke deaths worldwide
- The number of disability adjusted life years (DALYs) is 7 times compared to high income countries

Mathers CD et al. Global Burden of Disease. 2006

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“the current global burden of stroke is 16 million. First-ever strokes, 62 million stroke survivors, 51 million DALYs, and 5.7 million deaths in 2005. Without additional population-wide interventions, . Figures are predicted to increase to a staggering 23 million . First-ever strokes, 77 million stroke survivors, 61 million DALYs, and 7.8 million deaths by 2030.”

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