Introduction – Stroke

- apoplexy, cerebrovascular accident (CVA)
- is a sudden interruption of the blood supply to the brain.
- a medical emergency
Types of stroke

Hemorrhagic Stroke
15%

Ischemic Stroke
85%
ACT FAST!

Time lost is brain lost!!

SPOT A STROKE

Face Drooping
Arm Weakness
Speech Difficulty
Time to Call 911

Stroke Warning Signs and Symptoms
Continuous quality improvement activities

Primary prevention

Community education

EMS response

Secondary prevention

Acute treatment

Rehabilitation

General Picture of Tx
Acute management for IS

Treatment fall into 6 categories

1. Medical support
2. Intravenous thrombolysis
3. Endovascular techniques
4. Antithrombotic treatment
5. Neuroprotection
6. Stroke centers and rehabilitation
(1) Medical support

- ABC
- IV fluid
- Cardiac monitoring & treat arrhythmia
- Antipyretics

- Should be normoglycemia (90-140 mg/dL)
  - Treat hypoglycemia (D50) & hyperglycemia (insuline)
- Candidates for IV fibrinolytic treatment
  - BP > 185/110 mmHg
  - First, labetalol, nitroglycerin paste, or IV nicardipine

Supportive Therapy

Glucose Management
- Infarction size and edema increase with acute and chronic hyperglycemia
- Hyperglycemia is an independent risk factor for hemorrhage when stroke is treated with t-PA

Antiepileptic Drugs
- Seizures are common after hemorrhagic CVAs
- ICH related seizures are generally non-convulsive and are

Hyperthermia

- Treat fevers!
  - Evidence shows that fevers > 37.5 C that persists for > 24 hrs correlates with ventricular extension and is found in 83% of patients with poor outcomes
(2) Intravenous thrombolysis

- Restore blood flow to ischemic regions of the brain
- "<3H": prevent neurologic deficits
- tPA – the major tx of IS

Administration of rTPA

Main eligibility criteria

- Treatment given within 3hrs)
- Intracranial bleed excluded
- Age <80
- Early major infarction excluded (parenchyma hypo-attenuation or brain swelling >1/3 MCA territory)
- NIHSS score <22
- BP < 185/110
- Not on warfarin or heparin, platelets and coagulation normal
- Treatment given by a specially trained physician
- Facilities for close monitoring

Fast Facts
- Tissue plasminogen activator
- "clot buster"
- IV tpa window 3 hours
- IA tpa window 4.5 hours
- Disability risk ↓ 30% despite ~5% symptomatic ICH risk

Contraindications
- Hemorrhage
- SBP > 185 or DBP > 110
- Recent surgery, trauma or stroke
- Coagulopathy
- Seizure at onset of symptoms
- NIHSS >21
- Age?
(3) Endovascular techniques

Oclusions of large arteries (MCA, ICA, BA)

involve a large clot volume

failure to open with IV tPA alone.

thrombolytics via an intra-arterial route

- concentration of drug at the clot site

(4) Antithrombotic treatment

Asprin
- Only antiplatelet agent effective for the acute treatment of IS
- Use within 48 h of stroke onset: ↓ recurrence risk and mortality

Rivaroxaban
- Selective inhibitor of factor Xa
- "bridging anticoagulation"

Abiciximab, Ancrod (clinical trials)

Mechanical Thrombolysis

- Often used in adjunct with tPA
- MERCI (Mechanical Embolus Removal in Cerebral Ischemia) Retrieval System is a corkscrew-like apparatus designed to remove
Aspirin
- Antiplatelet agent, irreversible COX inhibitor
- Prevent adhesion and aggregation of platelets
- Dose of 81 mg enteric-coated aspirin is usually started

Warfarin
- Oral anticoagulant
- Slow onset
- Narrow therapeutic index, teratogenic
- Drug-drug interaction
  - Inducers - phenytoin, rifampin, barbiturates
  - Inhibitors - amiodarone, SSRI, cimetidine

Platelet aggregation inhibitors
- Abiciximab
- Clopidogrel, Tidopidine
- Dipyridamole

Lipid lowering drugs
- ↓ LDL
- Atorvastatin, Cholestyramine, Ezetimibe
(5) Neuroprotection

- NMDA receptor antagonist
  - Dextromethorphan
- GABA agonist
  - Clomethiazole
- Free radical scavenger
  - Trihexyphenidyl

Rehabilitation

Focuses on improving

- Mobility
- Activity of daily living
- Communication
- Swallowing
- Shoulder pain
- Spasticity

BP Relationship

- BP increase is due to arterial occlusion (i.e., an effort to perfuse penumbra)
- Failure to recanalize (w/ or w/o thrombolytic therapy) results in high BP and poor neuro outcomes
- Lowering BP starves penumbra
- Every hospital should have a stroke unit
- A stroke should be managed by a multidisciplinary stroke team
- An efficient referral and rehabilitation system to be established for the success of a stroke unit

STROKE UNIT
Treatment of Hemorrhagic stroke

Supportive therapy (no direct therapy)

- Stabilize vital signs
- Intubation and hyperventilation
- Stop any medication that could increase bleeding (e.g. warfarin, aspirin)
- Evacuate the hematoma

Measure and control the pressure within the brain

Cont...

- ↓ ICP
  - Osmotic diuretics – mannitol
  - Loop diuretics – furosemide
- Anti hypertensive: Beta blocker
- Vitamin K, Fresh frozen plasma
- Acetaminophen: to reduce fever and headache
- Antiemetic agents: Promethazine
- Anti acids: for stress ulcers
Primary and secondary prevention

A- antiplatelet and anti coagulants
B- blood pressure lowering medication
C- cholesterol lowering, cessation of smoking
D- diet
E- exercise
The Heart

- Is a muscle the size of a clenched fist
- Is located behind the breastbone
- Pumps about 100,000 times a day
- Pumps about 7,600 litres of blood per day
What Is Heart Attack?

- Occurs when the coronary arteries that supply the heart muscle become blocked.

- Partially blocked it causes angina.

- When fully blocked it causes a myocardial infarction or a heart attack!
Figure 1-3. Gradual narrowing of a coronary artery through the progression of atherosclerosis.
Risk Factors

- Unchangeable Risk Factors
- Changeable Risk Factors
Warning Signs

- Chest pain (angina)
- Heaviness, tightness, pain, burning, pressure or squeezing
  - behind the breastbone or in the arms, neck, or jaws
- Perhaps no pain
Other warning signs of a heart attack

- Shortness of breath
- Sweating
- Nausea
- Light-headedness

- Chest discomfort
- Arm or back discomfort
- Neck or jaw discomfort
- Trouble breathing, with or without chest discomfort
- Feeling light-headed or breaking into a cold sweat
- Feeling sick or discomfort in your stomach
In the last one hour 350 people just died in India of CVD
Obesity

How can I bring down my cholesterol levels?

- Proper diet
- Exercise regularly
- Stop smoking
- Reduce alcohol
- Follow the medication prescribed by your doctor
- Remember, what is good for you, your doctor knows the best
Diagnosis

- Typical History
- Electrocardiography
- Serum Cardiac Markers
- Echocardiography
- Stress Testing
- Myocardial Perfusion Imaging
- Coronary Angiography

What you must do?

- Call for help
- Do not attribute it to “Gas”
- Reach a hospital as soon as possible
- Insist on an ECG
- Attempt Cardiopulmonary Resuscitation
Treatment

- Drugs
- Angioplasty & Stent
- Coronary Artery Bypass Surgery

- Aspirin is an antiplatelet agent
- Aspirin should be given in a dose of 75-325 mg/day to all patients with ACS unless there is a contraindication
- Clopidogrel is a potent antiplatelet agent
- Give 300 mg loading dose followed by 75 mg/day
Cardiopulmonary resuscitation

- Help during a cardiac arrest
- Give breaths and pump the heart
- Done by ordinary people
- Saves lives
Primary Angioplasty