Evaluation of Stroke in Young Adults

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Stroke and age.

Stroke in the young adults = 15-45 years
What Is A Stroke?

- A stroke occurs when blood flow to the brain is interrupted by a blocked or a ruptured blood vessel.

- A brain attack.
Acute stroke is typically characterized by the sudden onset of a focal neurologic deficit, though some patients have a stepwise or gradual progression of symptoms.
Stroke Warning Signs

- Sudden weakness or numbness of the face, arm or leg, especially on one side of the body
- Sudden confusion, trouble speaking or understanding
- Sudden trouble seeing in one or both eyes
- Sudden trouble walking, dizziness, loss of balance or coordination
- Sudden, severe headaches with no known cause (for hemorrhagic stroke)
Stroke versus Stroke Mimics

- CN neuropathy only: Bell’s palsy, other CN palsy
- Spinal cord disease esp. cervical part
- Postictal phase of seizure
- Hypoglycemic hemiparesis
- Conversion reaction
Before diagnosis Stroke in Young Adults

Stroke versus Stroke Mimics

- Brain tumor
- Brain abscess
- CNS Demyelinating disease
- Etc.
Etiology of young stroke: 5 pathogenic

1. Vessel wall
2. Cell
3. Plasma
ISCHEMIC: Large artery disease

- Premature atherosclerosis is the single most important cause of stroke as age advances.
- Incidence is 7-30% below the age of 50 years.
- It is presumed in all undiagnosed cases with more than two risk factors.

Small vessel disease

- Vasculopathy (infectious, non-infectious, microangiopathy)
ปัจจัยเสี่ยงหลัก

การสูบบุหรี่

ความดันโลหิตสูง
ไขมันสูง

อาหารหวาน
ปัจจัยเสี่ยงอื่น ๆ

- ไขมันในเลือดสูง
-เบาหวาน
- อ้วน
- ขาดการออกกำลังกาย
Risks for Atherosclerosis

- Male sex
- Systemic hypertension
- Diabetes mellitus
- Dyslipidemia (low HDL cholesterol, hypertriglyceridemia)
- Cigarette smoking
- Alcohol abuse
- Recent infection
- Oestrogen related stroke including oral contraceptives
NON ATHEROCLEROTIC VASCULOPATHIES

- Vasculitis: SLE, Post herpes zoster ophthalmicus, fungal meningitis, polyarteritis nodosa, etc.
- Radiation-induced vasculopathy
- Migrainous infarction
- Cervicocephalic arterial dissections
- Traumatic cerebrovascular disease
- Moyamoya disease
- Fibromuscular dysplasia
- Etc.
Etiology of young stroke: Cell

Red blood cell
- Sickle cell disease
- Polycythemia vera

White blood cell
- Leukemia

Platelet
- Thrombocytosis
Hypercoagulable states
- antiphospholipid antibody syndromes, deficiency of antithrombin III or protein S or C, resistance to activated protein C, increased factor VIII, Paraneoplastic syndrome
- Disseminated intravascular coagulation
- Thrombotic thrombocytopenic purpura
- Venous occlusion

Hyperviscosity
- Multiple myeloma, bed ridden, dehydration
HEMORRHAGIC

- Subarachnoid hemorrhage
  - Cerebral aneurysm
- Intraparenchymal hemorrhage
  - Hypertensive bleeding
  - Arteriovenous malformation (AVM)
  - Neoplasm (primary central nervous system, metastatic)
  - Hematological disorders (leukemia, neoplasm, thrombocytopenia)
  - Moyamoya disease
  - Drug use (warfarin, amphetamines, cocaine, phenylpropanolamine)
  - Iatrogenic (peri-procedural, Drug using: heparin, warfarin, SK, rt-PA)
Etiology of young stroke: 4. Heart

- Arrhythmias: AF
- Rheumatic heart disease
- Congenital heart disease
- Endocarditis
- Mitral valve prolapse
- Patent foramen ovale
- Atrial myxoma
- Cardiac surgeries and procedures
- etc
Transesophageal echocardiogram showing a thrombus (arrows) passing from right atrium (RA) to left atrium (LA) through a patent foramen ovale.
Etiology of young stroke: 5. Metabolic & drugs

- Cadasil
- MELAS
- Fabry disease
- Homocystinuria
- Menkes’ disease
- Cocaine, methamphetamine, oral contraception, etc.
Etiologies of young stroke in summary

The chart illustrates the distribution of stroke etiologies across different age groups. The categories include:
- Undetermined
- Small-vessel disease
- Other determined
- Large-artery atherosclerosis
- Cardioembolism

The percentages are shown for each age group (15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49).

- In the 15-19 age group, undetermined etiologies are the highest, followed by other determined and large-artery atherosclerosis.
- In the 20-24 age group, undetermined etiologies again dominate, with other determined and cardioembolism being the second and third highest.
- For 25-29 age group, undetermined etiologies are also the highest, followed by other determined and small-vessel disease.
- In the 30-34 age group, undetermined etiologies are again the highest, with other determined and cardioembolism being the second and third highest.
- For the 35-39 age group, undetermined etiologies remain the highest, followed by other determined and small-vessel disease.
- In the 40-44 age group, undetermined etiologies are the highest, followed by other determined and cardioembolism.
- For the 45-49 age group, undetermined etiologies are again the highest, with other determined and small-vessel disease being the second and third highest.

Overall, undetermined etiologies are consistently the highest across all age groups, indicating a need for further investigation to understand the causes of young stroke.
In young adults (15–45 years) has been estimated at approximately 2–11 per 100,000 in Caucasians, 22.8 per 100,000 in African Americans

10/100,000 in a Mayo Clinic study of women ages 15 to 29
- Responsible for about 5% of all cases of stroke
- Incidence is much higher in developing countries like India.
- Above the age of 30 years stroke is more common in males whereas below that female predominance is seen.
Young stroke is stroke occurring between 15 and 45 years of age.

- Stroke in young adults is surprisingly common.
- Many conditions is similar to stroke: stroke mimics
- Differential diagnosis for potential etiologies is broader than that for older adults.
- Definite diagnosis is necessary to prevent recurrent stroke.
- Even after extensive investigations, the cause may remain elusive in 20-50% cases.
- Prognosis depends on the underlying factor.
Thank you for your attention