Stroke - Part 1

Stroke...most significant event in my life .. more than my marriage .. or having children.

Stroke survivor

Stroke facts

• 1 in 8 general /1 in 3 geriatric medical beds
• Mortality: 2nd leading cause of death over 60s / 5th leading cause of death 15-59year olds. 5% ischaemic stroke(40-64 yrs) died within 30 days. >75yrs 15-20% died
• 5 year survival: 56% men, 64% women
• Incidence 179/100,00 per year : 15 million people suffer stroke annually
• 5 million die/5 million left with disability
• Stroke burden increased from
-38million DALY's '90
-50million DALY's '99
(DALY=disability adjusted life years)
- $20 billion/year in USA direct expenditure on stroke
- 4% National Health Service in UK on stroke (2000)
- Stroke accounted for 10% deaths (2002)
-cardiovascular 13%
-cancer 12%
- >9,500 cases per annum in Ireland

30, 000 survivors
- Much more subclinical disease: dementia, gait disorders

Definition

 Focal or global neurological deficit due to presumed vascular disease lasting greater than 24 hours or causing death within 24 hours

Cause

Haemorrhage 10-15%
Infarction 85-90%, of which
- 20% cardioembolic
- 50% carotid artery disease
- 30% other (NB aortic arch plaque, small vessel disease, thrombophilia)

Cellular mechanisms

- Release of excitation neurotransmitters (e.g. glycine and glutamate)
- Calcium influx into nerves
- Non-physiological enzyme reactions within neuronal cells
- Toxic products (e.g. Nitric oxide and free radicals)
- Cell death

Stroke Units
save lives, disability and money: reduce death and disability by a quarter!!!!

Medical priorities

- Get diagnosis right
- Acute treatment as appropriate
- Find cause(s)
- Secondary prevention
- Assess neurological deficits (emphasis on cognitive)
- Appropriate screening + referral, eg, swallow disorders
- Assess and treat co-morbidity
- Treat medical complications (60% during hospital stay)
- Inform and advise, prognosis
- TIME IS BRAIN – speed important, especially for thrombolysis

Right diagnosis ? mimic

Epileptic seizure (Todd's paresis)
Sub-dural / Tumour
Vasculitis/ Encephalitis
Multiple Sclerosis
Hemiplegic migraine
Metabolic/toxic encephalopathy
eg hypoglycaemia, alcohol etc)

Risk factors (relative risk) approx OR

▪ Rheumatic atrial fibrillation	17
• Non-Rheumatic atrial fib	7
• Prev stroke or TIA	7
▪Carotid stenosis	5-15
• Coronary artery disease/ recnt MI	2-4
▪ Hypertension	2-4
▪ Cigarettes	2-4
▪ Diabetes	2
▪ Mild to heavy alcohol	1-4

▪Increasing age
▪Male Gender
▪Hyperhomocystinaemia

Hx

Presenting complaint:
?head injury ?sudden onset (hallmark)
Previous function / driving ? golfing !
Social Hx: accommodation /supports/ smoking/ occupation
Prev stroke/TIA, RhF, DM, BP, IHD, CCF, AF
Fam Hx; Stroke/TIA, BP, dementia

O/E

Alert/ Responsive/ Pain ?
Vitals: BP / Temp / SaO2 / HR / GCS
ECG Rhythym/ ? C'megaly, ftailure
Valvular disease/ Carotids/PVD
Neuro/cognition (Stroke Part 2)

Investigation

ESR, FBC, U&E, LFTs, Ca^{++}
Glucose
Fadting Lipid profile (within 24 hours of stroke)
Urinalysis, ECG,CXR
CT (to rule out haemorrhage, not to find an infarct – nil seen in 1/3 of infarction if done early) or MRI
Carotid dopplers (if pt has non-disabling carotid territory ischaemic event)
Holter monitor if sinus rhythm
MRI for brain stem event or diagnosis unclear/atypical symptoms

Treatment

Treat in a **Stroke Unit**, ie, under direct care of specialist with expertise in stroke and dedicated inter-disciplinary team of nurses, physio, OT, speech therapist, social worker, clinical nutritionist and psychologist.

Medical therapeutic options

▪Aim of management of acute ischaemic stroke is to minimize mortality/morbidity by rapidly restoring and maintaining blood flow to the ischaemic brain and limiting damage to the ischaemic penumbra.

▪*Hyperacute treatment*

- **thrombolysis** rt-PA 0.9 mgs/Kg to max 90 mgs IV (given under direct specialist supervision).Within 3 hours of symptom onset in cerebral infarction and.....
-no CT/MR changes of establshed stroke (eg oedema, sulcal effacement)
-outrule other exclusion crireria eg intracranial haemorrhage, recent GI bleeding, recent surgery

11% absolute better chance of independence at 3 months BUT X 3-5 risk of intracranial haemorrhage in early stage (some fatal)
-applicable to about 5-10% due to limited time window (may improve with newer agents, better pre-hospital care, triage and processing).

▪*Acute treatment*

- Aspirin: 12 less deaths per 1000 treated with aspirin in 2-4 weeks post stroke

▪***Prevention; immediate and ongoing longterm managememrnt of stroke patients to minimize recurrent events***

Lifestyle is key!

-Smoking; cessation decreases risk of stroke by approx 1.5 times
-Hypertension; target ≤ 130/80: ACE-inhibitors widely used, but may just be antihypertensive effect
-Statins – as much as can be tolerated, regardless of cholesterol, and total cholesterol target total <3.5, LDL ≤ 2
-Exercise >3 x 30 min weekly

Atrial Fibrillation; Chronic and paroxysmal AF both of similar stroke risk. Warfarin reduces risk of 2nd stroke in patients by 66%

-Benefit of anticoagulation is increased in those with a higher absolute risk of stroke eg >75years, hypertension, diabetes, previous TIA/stroke
-Aspirin reduces the odds of 2nd stroke by approx 17%

Surgery

• Better than medical treatment in secondary prevention of stroke in those **with**
-Symptoms and > 70% stenosis of corresponding carotid artery
Reduces relative risk of stroke by approx 48% . Shoule be done within 2 weeks of symptoms for max. benfit.
-Risk of intraoperative stroke 1-3%.
Also Hoarseness, tongue weakness, facial numbness, infection, haematoma
• Asymptomatic stenosis. Risk less about 2% per annum. Surgery reduces risk by 50%
• Benefit from endarterectomy dependent on low operative risk e.g ≤ 3%.

TIA & risk of stroke:

Transient Ischaemic Attack: Transient interruption to cerebral or retinal circulation producing focal neurological symptoms resovling fully within 24 hours.

- Like "Brain angina" A TIA is a medical emergency.
-15% stroke preceeded by a TIA most occur in preceeding week.
Common patterns
-Amaurosis fugax (monocular blindness)
-Hemiplaresis or hemisensory loss
- Speech disturbance/acute confusion +/- facial/arm weakness
- Diplopia/visual field loss / ataxia/ dysarthria/ vertigo combinations.

- High risk factors e.g ABCD
Age > 60 / **B**lood Pressure > 140/90
Clinical: hemiparesis > speech
Duration > 60 minutes

-Other high Risks: recurrent event / a-fib/ recent MI/ neck trauma.
-High risk patients need admission - - All patients should be seen within a week at a specialised clinic for assesment of risk factors. Good evidence for effect.
-Patients should be advised not to drive x 1/12 after a TIA.