



Falls and bone health – Part 1

Falls

Falls are common among older people.

One third of community-dwelling individuals older than 65 years fall every year

Associated with significant morbidity/mortality:
5-10% of falls cause serious injuries (hip fracture/subdural/psychosocial)

Up to 50% of older fallers unable to get up after fall (rhabdomyolysis; pneumonia; hypothermia)

Greater likelihood of nursing-home placement

Diverse aetiology.

Diagnostic evaluation influenced by thorough history and examination.

Aetiology of falls

(overlap between all three)

- **Simple trip**
- **Falls without loss of consciousness**
- **Falls with loss of consciousness –**
 - Syncope
 - Seizure
 - Stroke

General risk factors for falls

Key is **Neurovascular instability**

Age – postural sway

(Incidence of falls increases with age)

Neurological

NB Vascular gait dyspraxia

Pyramidal weakness

Extrapyramidal syndromes

Cerebellar/Vestibular disorders

Cognitive impairment

Sensory impairment

Peripheral neuropathy

Visual impairment

Epilepsy

Cardiovascular

NB Postural hypotension

Carotid sinus syndrome

Vasovagal episodes

Arrhythmias

Critical valvular lesions

Structural

Muscular eg. Myopathy

Rheumatological e.g. OA

Drugs ≥4 medications assoc with ↑ risk of fall

Antihypertensives

Sedatives/neuroleptics

Antidepressants esp. TCAD

Levodopa

Anticholinergics

Alcohol

Environment

Lighting

Floor surface

Footwear

Cotsides

Clutter

Assessment of the older faller

History

A Prior to fall

Posture - lying/sitting/standing

Warning symptoms – dizziness (should not be confused with vertigo)/visual/palpitation/aura/focal weakness

Environment – Obstacles/visibility

B During the fall (often need a collateral history)

Loss of consciousness (including duration)

Seizure activity* (jerking/incontinence/tongue biting)

*may occur in syncope

Focal neurological signs

C After the fall

Focal neurological signs

Post-ictal state

Injuries sustained

Isolated incident? Or recurrent falls

Physical examination

Evidence of injury

Neurological

Pyramidal

Extrapyramidal

Cerebellar

Cognitive function

Gait

Cardiovascular

Pulse rate and rhythm

+/- carotid sinus massage

Lying and standing blood pressures

Murmurs/carotid bruits

Rheumatological

Function

Level of assistance required/ Use of walking aid

Investigations

ECG

Postural blood pressures

Carotid sinus massage

No place for routine-

- EEG

- Echo

- 24 hr. holter, (unless history suggestive or abnormal ECG)

Prevention of falls

Individual vs. population prevention

Risk Assessment



Tinetti's risk factor index looks at: -

- Sedative drug use
- Cognitive impairment
- Foot problems
- Lower extremity disability
- Abnormalities of gait/balance

Risk of falls rises from 8% with one risk factor rising to 78% with four risk factors

Exercise programmes

FICSIT trial –

Exercise reduced risk of falls by 10%

By 23% if balance training exercise

No reduction in fall-related injuries

Participation in once per week tai chi classes for 16 weeks can prevent falls.

Low bone density increases the risk of hip and other fractures and should be identified and treated.

Vitamin D + Calcium supplementation in older nursing home patients reduced hip fracture by 20%.

Hip protectors-studies have been inconsistent and contradictory; 2007 trial of more than 1000 nursing home residents - no benefit.

Individual risk factor modification – difficult to study.

Treatment

Multidisciplinary approach

Treat underlying medical illness (Up to 10 percent of falls unrelated to syncope are related to acute illness)

Stop offending medications/ reduce the total number of medications

Physiotherapy – gait assessment and prescription of muscle strengthening and balance training exercise.

Occupational Therapy –assessment of environment and modification of home hazards

Postural Hypotension

Definition: fall of > 20mmHg systolic or 10mmHg diastolic in BP

Patient should be supine for 15 minutes initially

Standing blood pressures should be measured at 2 and 5 minutes.

Aetiology:

Idiopathic (probably hypertension-related)

Prolonged bedrest

Autonomic neuropathy – diabetes/alcoholism

Drug induced – anti-parkinsonian medications

Antihypertensives

Antidepressants

?Shy-Drager syndrome (Parkinsonism plus)

Treatments

Stop offending drugs

Avoid sudden standing

Mineralocorticoids

Alpha-adrenergic agents (midodrine)

Syncope

Transient loss of consciousness due to lack of blood supply to brain.

Causes-

Excess vagal tone – vasovagal episode

Prolonged valsalva manoeuvre –cough syncope

Carotid sinus syncope (see below)

Postural hypotension (see above)

Cardiac arrhythmia

Critical valvular lesions

Vertebrobasilar TIA

Carotid sinus syncope

Stimulation of carotid sinus baroreceptors causes bradycardia (cardioinhibitory) and a slight fall in blood pressure (vasodepressor response).

This response normally becomes less marked with age.

In people with Carotid Sinus Hypersensitivity tight collars,sudden neck movements or cervical osteophytes may cause syncope due to profound bradycardia or hypotension(10% of cases).

Bradycardia can be demonstrated by performing carotid sinus massage by a trained senior clinician while connected to a cardiac monitor and a non-invasive continuous BP monitor.

Positive cardioinhibitory response - asystole > 3 secs.

Positive vaso-depressor response - Systolic BP Drop >50mmHg or >30mmHg with symptoms.

Some patients have both.

Contraindications to testing - recent MI, known stroke disease or carotid bruit.

Complications - arrhythmia + stroke 0.14%

Treatment – First line -Dual chamber pacemaker.

Second line - Anticholinergics and glossopharyngeal transection

Routine consideration should be given to bone health status in all older people who fall (AgePage 10)