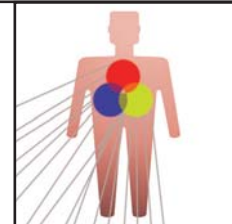


Falls, osteoporosis and atrial fibrillation



BACKGROUND Poly-morbidity is the hallmark of the frail elderly. The traditional model of treating each disease on its own merit does not work for this patient group.

OBJECTIVE This article outlines the assessment, investigations and management of falls and atrial fibrillation in the elderly.

DISCUSSION The challenge for the general practitioner lies in weighing up the potential benefits and harms of the 'curative' approach against those of the 'palliative' approach. The key concern should always be the patient's desired quality of life. Forgoing largely unproven 'medical heroics' in favour of supportive services in association with available community resources helps to maintain the patient's independence and dignity.

Case history – Cecilia

Cecilia is 78 years of age and lives alone in her home of 45 years. She lives in a close knit community and manages well with home help and the support of her neighbours. She has recently felt 'dizzy', and has had several falls in and around the house. On examination, her blood pressure is 160/90, her pulse 90/minute and irregular. Her electrocardiogram confirms atrial fibrillation with a ventricular response varying between 42–120 beats/minute. *Figure 1* summarises Cecilia's medical history and current medications.

Cecilia – 76 years of age

| | |
|------------------------|---|
| Social history | Retired primary school teacher Widowed for the past 4 years Lived in own house for past 45 years 2 daughters, 1 son, all living interstate Used to smoke up to 10 cigarettes in her 20s |
| Habits | 2 glasses of wine with dinner Occasionally takes her 2 dachshunds for walks |
| Allergies | Sulphur and penicillins Leukoplast |
| Family history | Father died aged 82 from stroke Father had MI aged 67 Mother died aged 70 from renal failure secondary to Bex and Vincent's powder Brother and sister alive, both have osteoporosis and are treated for blood pressure |
| Medical history | Hypertension Osteoarthritis of knees and hips Thoracic osteoporotic crush fracture Reflux oesophagitis Duodenal ulcer aged 42 Hysterectomy aged 43 |
| Medications | Irbesartan 150 mg/hydrochlorothiazide 12.5 mg Aspirin 100 mg Alendronate 70 mg per week Diclofenac 25 mg tds Omeprazole 20 mg Multivitamin tablets Tiger balm |

Figure 1. Cecilia's medical history

commonly associated with falls include drugs, dementia, depression, vision impairment, gait disorders and lower limb problems.

A new clinical sign

Cecilia's short history of dizzy spells associated with the finding of atrial fibrillation (AF) is highly suggestive of underlying cardiac disease, in particular ischaemic heart disease and sick sinus syndrome. Mitral valve disease



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Assessment

Falls are a potent marker for underlying disease and are rarely triggered by a single cause. Even in the presence of a good history or a highly significant clinical sign, other causes need to be explored (*Figure 2*).¹ Factors

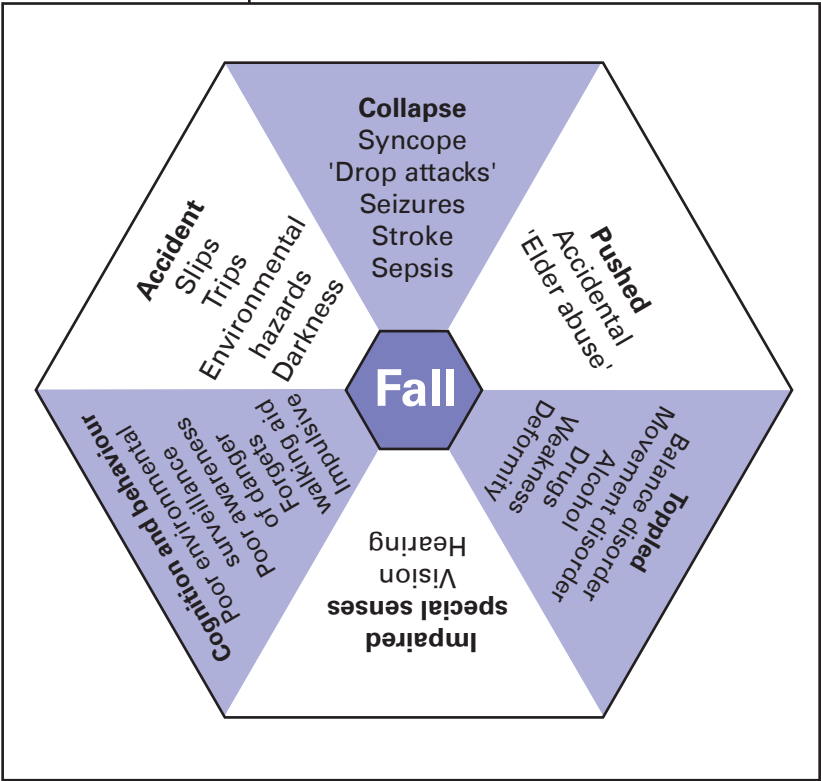


Figure 2. Causes of falls

needs to be considered on the basis of the prevalence of diseases such as rheumatic fever, diphtheria, and scarlet fever during Cecilia’s childhood (*Table 1*).

Gait examination

A full examination of Cecilia’s gait is required including posture, getting up from a chair, one leg stance, walking, turning, heel-toe walking, Romberg test and righting reflex. Standing blood pressure needs to be obtained to exclude postural drop, especially as she is taking a combined antihypertensive.¹ *Table 2* summarises the remaining physical findings.

Investigations

- Investigations to be considered would include:
- full blood examination (FBE) to exclude anaemia
 - urea, electrolytes and creatine (UEC) to exclude significant renal impairment and electrolyte disturbances
 - fasting blood sugar level (BSL) to exclude latent diabetes, and
 - lipid studies to quantify the risk of cardiac events.
- A Holter monitor should be considered if syncope associated with sick sinus syndrome is suspected. A cardiac exercise stress test should be considered to

Table 1. Causes of atrial fibrillation

| | |
|------------------|---|
| Cardiac | Mitral valve disease Hypertension Ischaemic heart disease Myocardial infarction Sick sinus syndrome |
| Endocrine | Thyrotoxicosis |
| Other | Alcohol Infections |

Table 2. Cecilia’s clinical findings

| | |
|----------------|---|
| Gait | Stooped posture Uses arms to get up Unsteady on one leg stance Walks slowly Turns in wide circle Unable to heel-toe walk Romberg’s unsteady with closed eyes Righting reflex preserved |
| Cardiac | Standing BP 150/90 No cardiac murmurs No clinical signs of CCF |
| Vision | 9/6 corrected in both eyes |
| Mental | MMSE 27/30 GDS 1/15 |
| Bloods | Hb 125 g/L Creatinine 0.17 mmol/L BSL 6.0 mmol/L Cholesterol 6.8 mmol/L Triglycerides 2.4 mmol/L HDL 1.0 mmol/L LDL 4.6 mmol/L |
| Others | Holter monitor AF throughout, 30–148 No pauses of >2.0 sec Exercise stress test Negative at moderate workload |

exclude significant coronary artery disease. This may have to be substituted by a medication induced ses-tamibi stress test if Cecilia’s mobility prevents her from doing an exercise stress test. If a mitral murmur is present, or if there are clinical signs of significant cardiac failure, Cecilia will require echocardiography to determine the severity of valvular disease and left ven-tricular function.

Table 3. Cecilia's problem list

| Problems | Treatment aims | Potential problems |
|---|--|--|
| Social isolation | Maintain sufficient independence to interact with neighbours and friends Assure community bus for shopping etc | Depression |
| Gait disorder Osteoarthritis | Prevent falls Physiotherapy to improve gait and to start muscle strengthening program Instruction in use of walking aids Home exercise program Occupational therapy – assessment for rails | Fractures, especially hip Head injuries, especially subdural haematoma |
| Hypertension | Maintain BP – control and prevent postural drop | Postural drop exacerbating falls Lethargy |
| Atrial fibrillation | Restore sinus rhythm Prevent stroke | Lethargy Stroke Complications from anticoagulation |
| Reflux oesophagitis | Control symptoms Ensure aledronate is taken correctly | Worsening symptoms Oesophageal ulceration |
| Polypharmacy Renal impairment | Prevent drug toxicity and drug interactions Monitor creatinine | Drug toxicity and drug interactions |
| Mild anaemia Impaired glucose intolerance Hyperlipidaemia | Observe for deterioration Evaluate the need for further interventions | Drug related complications from treatments that do not alter the long term outcome |

Managing Cecilia

Her problem list

To effectively manage Cecilia's complaints requires the development of her problem list, treatment aims and the consideration of potential complications (*Table 3*). Managing Cecilia holistically will involve consideration of all the issues in her problem list concomitantly, which invariably means finding a compromise between the suggestions offered by 'management guidelines' for each individual problem.

This article will focus on Cecilia's falls and the management of her newly diagnosed AF.

Falls

Cecilia's gait assessment is highly suggestive of neurodegenerative brain disease,¹ and her risk of falling is increased by her fixed, stooped posture secondary to previous osteoporotic vertebral fractures. As a conse-

quence, general deconditioning – often due to joint and muscle pain – occurs. Building up physical condition is best achieved through careful pain management, plenty of encouragement, and the involvement of a physiotherapist for muscle strengthening, stretching of contracted muscles, hydrotherapy, home exercise program, gait retraining and balance exercises (see Patient education page 233 this issue) and an occupational therapist for walking, negotiating environmental hazards, and the use of walking aids.

Improved mobility invariably decreases the need for anti-inflammatories and analgesics, hence regular dose adjustment is warranted. Paracetamol is the preferred medication; it is safe and effective if taken in appropriate dosages, which is now easier to achieve with the release of 'paracetamol extend'. Care needs to be taken with nonsteroidal anti-inflammatory drugs (NSAIDs) as they commonly lead to fluid retention. Cecilia already

Table 4. Risks and benefits of bisphosphonates in the prevention of osteoporotic fractures – summary from the fracture intervention trial²

| BMD | Place | Frequency % | OR (CI) | ARR* % | NNT** |
|--------------|-------|--------------|------------------|--------|-------|
| femoral neck | All | 14.1 vs 12.3 | 0.86 (0.73–1.01) | 1.8 | 55.5 |
| | Hip | 1.1 vs 0.9 | 0.79 (0.43–1.44) | 0.2 | 500.0 |
| | Wrist | 3.7 vs 3.2 | 1.19 (0.87–1.64) | 0.5 | 200.0 |
| | Spine | 3.8 vs 2.1 | 0.56 (0.39–0.80) | 1.7 | 58.8 |
| <-2.5 SD | All | 19.6 vs 13.1 | 0.64 (0.50–0.82) | 6.5 | 15.4 |
| <-2.0 SD | All | 11.1 vs 9.0 | 0.78 (0.65–0.94) | 2.1 | 47.6 |

* ARR = absolute risk reduction **NNT = number needed to treat

Table 5. Risks and benefits of anticoagulants and antiplatelet agents in AF

| Outcome | Strategy | Frequency % | OR (CI) | Significance | ARR % | NNT |
|------------------------|--------------------------------|-------------|------------------|--------------|-------|-------|
| Stroke | Warfarin vs placebo | 3.0 vs 8.7 | 0.34 (0.25-0.46) | p=0.00 | 5.7 | 17.5 |
| | Warfarin vs antiplatelet drugs | 3.2 vs 5.6 | 0.63 (0.45-0.90) | p=0.01 | 2.4 | 41.6 |
| | Warfarin vs aspirin | 3.6 vs 5.4 | 0.65 (0.44-0.97) | p=0.03 | 1.8 | 55.5 |
| Haemorrhage | Warfarin vs placebo | 2.2 vs 0.9 | 2.35 (1.20-4.24) | p=0.005 | -1.3 | 77 |
| | Warfarin vs antiplatelet drugs | 1.5 vs 0.7 | 1.82 (0.95-3.48) | trend | -0.8 | 125 |
| | Warfarin vs aspirin | 1.6 vs 1.0 | 1.56 (0.77-3.18) | NS | -0.6 | 166.6 |
| Total mortality | Warfarin vs placebo | 8.2 vs 10.4 | 0.74 (0.53-1.04) | trend | 2.2 | 45.5 |
| | Warfarin vs antiplatelet drugs | 5.3 vs 5.6 | 0.94 (0.67-1.31) | NS | 0.3 | 333 |
| | Warfarin vs aspirin | 4.3 vs 4.6 | 0.95 (0.60-1.50) | NS | 0.3 | 333 |

has significant renal impairment and she takes an angiotensin converting enzyme (ACE) inhibitor.

Cecilia also has significant osteoporosis for which a bisphosphonate has been prescribed. As Cecilia has oesophageal reflux, ensuring the correct ingestion of tablets is important. Should Cecilia wish to cease taking a bisphosphonate she needs to be made aware of the risks and benefits – both being small in absolute terms – associated with this move. Findings from the fracture intervention trial indicate that fractures occur in 14.1% of women aged 55–80 years. Treatment reduces the rate to 12.3% (OR: 0.86, 0.73–1.01 – this can only be regarded as a trend, ARR: 1.8%, NNT = 55.5).² Table 4 summarises the risk reduction according

to various anatomical regions and the benefit of treatment according to the degree of initial bone loss.²

Atrial fibrillation

Atrial fibrillation is a common arrhythmia in the elderly affecting 9% of those over the age of 80 years.³ Management has two aims: reversal to sinus rhythm by either electrical or medical cardioversion, or rate control where reversal is not possible associated with anticoagulation to prevent strokes. Anticoagulation has become increasingly popular for AF in the past few years, especially for those at high risk, ie. those with diabetes, congestive cardiac failure and hypertension.

However, anticoagulation has its risks, and these

increase with age. *Table 5* summarises the findings of different treatment regimens from the Cochrane review⁴ and these should guide discussions with the patient. The figures would allow the conclusion that:

- 'doing nothing' very significantly increases the rate of strokes
 - warfarin increases the risk of major bleeds, and
 - overall mortality is rather similar between regimens.
- To date, there are no reliable data available to compare the effect of antiplatelet drugs to aspirin alone.⁵

How to proceed with Cecilia

A good indicator of Cecilia's future wellbeing is gauged by functional health assessment – self rated health is a sensitive indicator for future survival,⁶ as is the measurement of peak expiratory flow rate (PEFR),⁷ and the level of social support.^{8,9}

Assuming that both 'objective measures' point toward poor outcomes, one has to discuss with Cecilia the advantages and disadvantages of potentially 'curative' and 'palliative' approaches and their impact on her quality of life.

A person with a significant gait disorder has a high risk of falling again. Fall prevention will involve:

- the management of all medical conditions predisposing to falls
- muscle strengthening
- gait and balance rehabilitation, and
- a considered approach to the potential complications associated with the management of other health problems.

In Cecilia's case, alendronate and gastrointestinal complications, and warfarinisation and bleeding complications have to be carefully considered.

Cecilia decides to take aspirin, and diclofenac is replaced with 'paracetamol extend' 2 tablets three times per day or as required. She proceeds with the suggestion of a 'Webster' pack for her medications, and she agrees to an outpatient based gait and balance retraining program and the use of a rollator frame. A community nurse helps with showering and neighbours take her shopping and to 'senior citizens'.

Postscript

Cecilia was found dead in her bed 2 years later. She retained independence with the help of community services and her close knit social network. She had an occasional fall in the garden when she didn't use her frame, but did not have a stroke or haemorrhage.

Summary of important points

- Falls are usually multifactorial, and all possibilities need to be considered in the work up of the patient.
- In the elderly, AF often presents as a loss of function rather than palpitations.
- Warfarinisation is a dangerous business. The evidence suggests that in terms of overall mortality, antiplatelet therapy delivers equivalent outcomes to warfarin; the difference being disease specific mortality.
- Gait assessment should be part of the 'routine physical' for the elderly. Minor abnormalities in gait and balance can be corrected with a simple home exercise program.

Conflict of interest: none declared.

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