

THE FALLING ELDERLY

Dr Noor Hadfifah

INTRODUCTION

Each year, about one third of elderly above the age of 65 years old fall. Falls are so common amongst the elderly that we have at times taken it as an inevitable part of aging. While biological changes of aging do contribute to a general decline in the elderly, it is the effect of disease burden that has a greater impact on falls and instability.

Epidemiology

The prevalence of falls in a community setting in Singapore is about 17.2%⁽³⁾. The incidence is much higher in the institutionalized elderly. Incidence also increases with age and higher in females than males. One postulate is that women tend to have a more sedentary lifestyle and exercise less than men.

Falls and fall injuries

One of the most serious consequence of falls is injuries. The non fatal injuries sustained after a fall are hip fractures 1%, other fractures (3-5%), head injuries (5-10%), hematomas and soft tissue injury (30-50%)⁽²⁾. Although fractures occur in only 10% of falls, 87% of all fractures in the elderly is associated with falls. The risk for fall related injuries increases with age and women are at a higher risk than men for all injuries, except for head injury. This is possibly the combined effect of falls and osteoporosis.

Mortality

Although falls are rarely a direct cause of mortality, death occurs as a result of complications of falls. Fall related mortality are a result of brain injury or

complications of fracture hip. The mortality from falls increases with age and is higher in men than women. In one survey in Emergency Department in Tan Tock Seng Hospital, low impact falls is the most common cause of accidents in elderly and 43% were admitted to hospital. Of those admitted, 5.5% died in hospital. (Quah SC)

Psychological trauma

Even though 90% of falls do not result in injuries, the psychological trauma of falls may lead to fear of falling and self imposed reduction of mobility/activity⁽¹⁾. This self-imposed restriction is beyond the injuries sustained from falls. Well intention family members may also discourage activity as a means to reduce falls. Incidence of fear of falling is estimated to be around 40 to 70% in fallers. Intervention to reduce fear of falling can reduce the dependency and functional decline following a fall in the elderly.

Risk factors for falls

The causes of falls in the elderly are always multifactorial. This can be categorized into intrinsic patient factors, environmental factors, behavioral and social factors. Factors intrinsic to the elderly person, the type of activity, which is engaged, the hazards and demand of the environment contribute to most falls in varying degrees. The likelihood of falls increases with increasing risk factors. Some risk factors are listed in Table 1.

EVALUATION OF THE ELDERLY WHO HAS FALLEN

History of falls

A thorough history of falls is important to determine the mechanism of fall, the associated

NOOR HADFIZAH, MBBS, MRCP, FAMS
Consultant
Department of Geriatric Medicine, Tan Tock Seng Hospital

symptoms with falls, ability to get up after a fall and the consequences of the falls. They should be asked about the activities they were engaged in before the falls. Usually, activities which displace the centre of gravity e.g. changing positions, walking, climbing stairs are the most common activities associated with falls. The location of falls may be associated with hazards in that particular area. The symptoms if present before the fall may help the physician decide on the appropriate diagnostic tests.

The approach to falls can be further refined into 3 categories:

- κ **Falls with loss of consciousness**
 - Fits, epilepsy
 - Vasovagal syncope
 - Hypoglycemia
 - Cardiac syncope
 - TIA
 - Postural Hypotension.
- κ **Hot falls (falls due to acute medical illness)**
 - Acute Myocardial Infarcts
 - Stroke
 - Sepsis
 - Electrolyte abnormalities
 - Bleeding GIT.
- κ **Cold Falls**
 - Chronic intrinsic risk factors
 - Medications.

Thus, for a patient who presented with an acute fall, it is always important to exclude an acute medical illness.

Physical examination

The physical examination should include vision assessment, postural Blood Pressure, a

Table 1.

Intrinsic factors	Extrinsic factors
Mental health	Poor lighting
Cognitive impairment	Glare
Confusion	Uneven flooring
Depression	Loose carpet, throw rugs
Musculoskeletal	Slippery floor
Arthritis	Incorrect eyewear
Foot deformities	Inappropriate furniture height
Dizziness	Hazards in walkways
Visual impairment	
Auditory impairment	
Postural hypotension	
Neuromuscular disorders	
Medication	
Cardiac arrhythmias	
Social/Behavioral factors	
>80 years	
Living alone	
Poor safety awareness	
Risky behavior	

cardiovascular examination, a neurological examination and examination of the musculoskeletal system. Included in the physical examination should be a gait and balance assessment.

A simple gait and balance assessment is the timed “up and go” test. The patient is required to get up from a chair, walk 3 metres, turn and walk back to the chair and sit down. Previous studies have shown that patients who make it in more than 20 seconds have mobility problems and are at risk for falls. Those who take less than 10 seconds are independent and those who take 10 to 20 seconds are borderline⁽⁶⁾.

There is also a qualitative aspect to this test. The physician is able to observe if the patient requires assistance to get up from the chair, whether he is steady after getting up, if he shuffles when he walks and staggers, whether there is good arm

swing and during turning, whether he is steady or turn in numbers all this imply some qualitative impairment to his gait.

Medication review

A review of the patient's medication may reveal medication that can potentially cause falls (Table 2). The history may sometimes reveal the association between the medication and onset of symptoms or the falls e.g. the start of medication and the occurrence of stiffness and falls with maxalon.

Intervention for falls

Medical intervention will depend on the risk factors found during assessment and physical examination.

Postural hypotension

Incidence of postural hypotension in the elderly is around 20%. The most common symptom is giddiness on postural change but may also present as unsteadiness, weakness and cognitive changes. While it is not always reproducible, it is most likely detected in early morning. The cause can be either idiopathic or secondary to hypovolemia, autonomic failure from neurological disease or diabetes or medication.

Treatment will include review of any offending medication, correction of hypovolemia, non-pharmacological treatments e.g. pressure stockings, abdominal binders and behavioral modifications. Pharmacological treatment include drugs such as fludrocortisone and midodrine.

Table 2.

Effect		Examples of Medication
Drowsiness, unsteadiness, giddiness	Central acting medication	Tranquilizers Benzodiazepines Tricyclic antidepressants Antihistamines Codeine containing preparations
Postural hypotension	Vasodilators Antipsychotics Antiparkinsons Antidepressants Anticholinergics	Antihypertensives Cardiovascular drugs Haloperidol Mardopar Dopamine agonist Tricyclic antidepressants Artane Oxybutynin
Extraprymidal	Antipsychotics phenothiazines	Haloperidol, resperidone Maxalon
Electrolyte abnormalities	Diuretics	Hydrochlorothiazides, frusemide

Vision and falls

The three components of vision that may affect falls are visual acuity, contrast sensitivity and depth of perception. While contrast sensitivity and depth of perception may be difficult to measure, visual acuity is easily assessed with the Snellen chart.

There has been numerous data that associate poor vision with falls. There seems to be a dose response relationship i.e. the worse the vision, the higher the risk. However, there is no randomized trial to look at whether improving vision reduces fall rates. All the same, intervention to improve vision is recommended both to improve quality of life and to reduce falls⁽⁴⁾.

Cognitive impairment

Patient with cognitive impairment have loss in cognitive function which can result in lack of safety awareness, judgmental errors, overestimation of capacity, failing to remember limitations and impairments, agitation, hallucination, restlessness and delusions which predisposes them to falls. There is also physical impairment, which adds to their risk such as visuospatial dysfunction, agnosia, apraxia, and loss of proprioception and gait and balance problems⁽⁵⁾. Some of the medications given to control behavior may also contribute to the risk of falling. In the approach to preventing falls in cognitively impaired individuals strategies to adopt are:

1. Environmental manipulation by reducing the amount of furnishings in the room, provide enough room for the patient to wander, safety equipments e.g. grab bars, rails, fixed furniture level flooring.
2. Behavioral strategies – Identifying trigger factors for wandering e.g. stress, noise, hunger. Providing meaningful activity to counteract lack of activity

3. Provide increased supervision, use of alarm systems and use of protective garments e.g. hip protectors

Gait and balance disorders and falls

Treating the underlying cause of gait and balance disorders is the first step in the management of the problem e.g. treatment of Parkinson's disease, cervical myelopathy. Rehabilitation through balance and gait training can improve balance and gait in the elderly. Exercise can also improve endurance, gait speed and strength. There are few studies however, that have shown that exercises reduce fall rates; only one study demonstrates tai chi as a form of exercise which could reduce fall rates.

The guidelines on fall prevention recommend physical therapy as one form of intervention for falls. And this should include gait and balance training. At times, assistive devices may be prescribed to improve balance and safety. It is recommended that patients be taught proper use of these devices, as improper use can cause falls.

Environmental changes

While environmental changes alone have not been shown to reduce falls rates, it is commonly a part of the multifactorial intervention programme for fall prevention in the elderly. Home safety is usually assessed by the occupational therapist, but the physician can do an informal assessment by using a checklist.

CONCLUSION

Most falls are not part of aging, but are random and unpredictable. While not all falls can be

prevented, a multi faceted strategy of assessment and intervention can reduce the number of falls and future injury. It has been shown that the risk of sustaining an injury increases with fall frequency.

REFERENCES

1. Tinetti ME, Speechley M. Prevention of Falls Among The Elderly. *N Eng J Med* 1989; 320:1055-9.
2. Nevitt M, Cummings SR, Hudes ES. Risk Factors For injurious falls: A prospective study. *J Gerontology medical sciences* 1991; 46:M164-M170.
3. Chan KM, Pang WS, Ee CH, Ding YY, Choo P. Epidemiology of Falls Among the Elderly Community Dwellers in Singapore . *Singapore Med J* 1997; 36:427-31.
4. Harwood RH .Visual problems and falls . *Age and Aging* .2001; 30-S4:13-8.
5. Tideiksaar R. Risk of Falls and Injury in Alzheimer's Disease. *Focus on Geriatric Care and Rehabilitation*. 1998;12:1-12.
6. Podsiadlo D, Richardson S. The Timed "Up & Go" a test of basic functional mobility for frail elderly. *J Am Geriatr Soc*.1991; 39:142-8.

Questions

1. Fall prevention strategy would include the following except:
 - a. Keeping the patient from walking
 - b. Environmental modification
 - c. Rehabilitation
 - d. Prescribing appropriate aids and appliances
 - e. Referring to the eye surgeon for poor vision
 - f. Proper footwear.

2. Assessment of an elderly who has falls would include:
 - a. mental assessment
 - b. review of medication
 - c. doing a complete neurological assessment
 - d. checking the blood pressure
 - e. checking the vision
 - f. doing a home visit
 - g. all of the above.

3. Common causes of falls in the elderly would include the following except:
 - a. acute illness
 - b. joint pain
 - c. lower limb weakness
 - d. giddiness
 - e. poor safety awareness
 - f. accidental.