INVITED ARTICLE

FALLS

R E Owen, P W J Choo, K S Lee, F J Jayaratnam

ABSTRACT

An elderly person experiencing recurrent falls is at risk. He is at risk from injury sustained during the fall and at risk from the complications of immobiliy resulting from loss of confidence. Urgent early assessment and identification of causative and risk factors is essential.

Keywords: *Physiological changes, environmental hazards, drug history, comprehensive assessment.*

SINGAPORE MED J 1991; Vol 32: 81-83

INTRODUCTION

Falls have been defined as "events which lead to the conscious subject coming to rest inadvertently on the ground".

This definition excludes falls resulting from violence against the person or from a seizure or loss of consciousness.

Falls are common occurrences in the elderly. There is an age related increase in incidence, more marked amongst females. Falls may result in serious physical injury but even if the physical trauma is minor, serious psychological trauma may be experienced. The loss of confidence experienced following reapeated falls predisposes to increasing immobility which will lead to increasing muscle weakness which itself predisposes to falls. A series of falls may precipitate premature institutionalisation. Recurrent falls should always be viewed as an urgent medical problem. Patients experiencing falls should be investigated thoroughly.

Numerous surveys have documented the age-related increase in incidence of falls. A study has shown the incidence of falls in women to be 30% in those aged 65-69 years rising to 50% in those over 85 years[1].

Men were found to fall less frequently but still showed an age-related increase.Two other surveys showed figures of 21% in men (Sheldon)[2] and 43% amongst women and 20% in men and 40% in women (Overstall)[3].

Department of Geriatric Medicine
Tan Tock Seng Hospital
Moulmein Road
Singapore 1130

R E Owen, MRCP(UK)
(Formerly Senior Physician, TTSH)

P W J Choo, MRCP(UK), DGM
Senior Registrar

K S Lee, M Med (Int Med) (S'pore)
(Currently Senior Registrar, NUH)

F J Jayaratnam, AM, FRACP
Senior Physician and Head

Correspondence to: Dr P W J Choo

Fallers do not constitute a homogenous group. Each faller has to be assessed from a fresh view point. One individual may experience a single fall leading to severe injury and immediate hospitalisation. Another may suffer repeated falls suffering minor injury. The first individual may not have suffered any initial pathology and may have suffered a true accident whilst the second individual may have multiple medical problems which could escape medical attention.

History taking should provide some information as to whether the fall was an unusual occurrence or part of a recurring problem. The fall may have been a true accident or may have been associated with other symptoms such as chest pain or acute breathlessness indicating an underlying acute medical problem (Fig 1).

The history should not be restricted to purely clinical matters. The environmental history is alsovital. It is necessary to combine common sense with clinical acumen. A careful drug history is required as many drugs may affect different systems vital for normal posture, gait and mobility (Table I)[4].

PREDISPOSING PHYSIOLOGICAL FACTORS

The increasing incidence of falls with age can be partly explained by physiological changes which predispose the elderly to recurrent falls. These physiological changes are then compounded by multiple medical problems and the tendency for multiple drug therapies.

Postural instability has been studied by Isaacs[5] measuring body sway paths. He has been able to demonstrate that body sway increases with age especially in women. The elderly person may experience difficulty compensating for minor destabilising factors.

Visual acuity, proprioception and the vestibular system all undergo age related changes leading to decreased efficiency. The elderly individual is therefore predisposed to falls (Fig 2).

Medical conditions and iatrogenic disease easily aggravate the situation.

PREDISPOSING ENVIRONMENTAL FACTORS

It is essential to ensure that the environment is as safe as possible to reduce the risk of falling. Obviously all elderly people cannot be imprisoned in armchairs — that would be even more dangerous. However, sensible precautions should be taken which will not deprive the individual of his or her freedom.

Adequate lighting is essential, and floor should be even and free of obstacles. Chairs and beds should be of correct height to

Fig. 1 – Causes of Falls

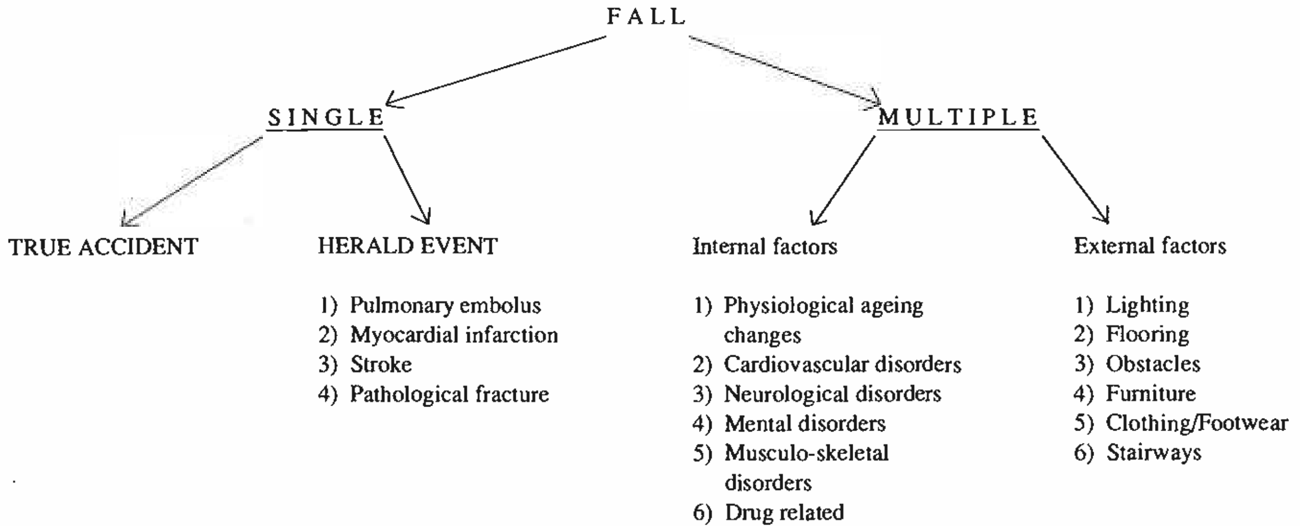
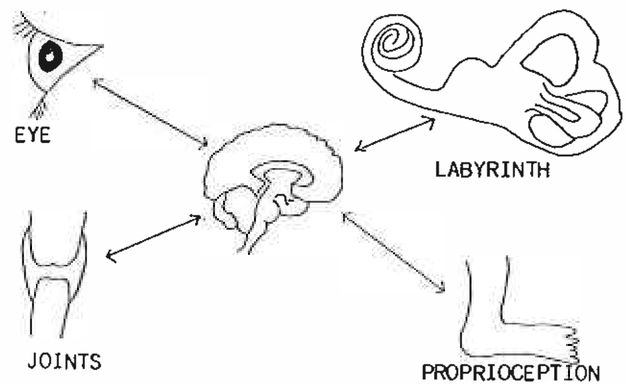


Table I
Drugs Implicated in Recurrent Falls

DRUGS	AFFECTS
Hydralazine Phenytoin Isoniazid	Toxic affect on peripheral nerves
Benzodiazepines Phenothiazines	Alter consciousness
Salicylates Non-steroidal anti-inflammatory (esp. Indomethacin)	Cause dizziness
Anti-hypertensives Phenothiazines Tricylic anti-depressants Levadopa Diuretics	Cause orthostatic hypotension
Benzodiazepines Phenytoin Aminoglycosides	Disturb gait and balance mechanisms
Phenothiazines	Impair vision

Fig. 2 – Physiological Changes



aid safe sitting and rising. Footwear should be supportive and fit properly. Badly fitting shoes may easily cause the wearer to stumble and fall.

Stairways are particularly hazardous for the elderly[6]. Walking downstairs is usually the biggest problem. Successful stair walking requires visual input and musculo-skeletal feedback. Many stairways are aesthetically pleasing but provide little information as to the exact position of the stair edge.

PREDISPOSING PATHOLOGY

There are many conditions which may present with repeated falls. It would be inappropirate to discuss each at length as excellent accounts are available in all the major textbooks. If a medical cause is likely then the history may point to the direction of further investigations.

A history of preceding giddiness should be followed by direct questions to uncover whether the giddiness is related to postural change.

Giddiness on standing, particularly first thing in the morning suggests orthostatic hypotension. A relationship to coughing, micturition and defaecation should also be sought.

Giddiness related to exertion may indicate inadequate cardiac output. Giddiness related to neck movement may lead on to investigation of vertebro-basilar insufficiency or a sensitive carotid sinus.

Other causes of giddiness to be considered are Meniere's disease and inner ear disorders.

An association with a temporary focal neurological deficit suggests a transient ischaemic attack and further investigations would be required.

It may be necessary to ask directly about palpitations. Paroxysmal arrhythmias may give rise to recurrent falls. A 24 hour ECG may be necessary for confirmation.

If there appears to be difficulty appreciating the environment then neurological conditions such as peripheral neuropathies and posterior column deficits should be considered and confirmed by examination.

Table II
Approach to Falls

1) History from patients		
2) History from eye-witness		
3) Drug history in minute detail		
4) Examination	– Patient Sitting	Check BP Examine cranial nerves Examine fundii Check cervical spine movement
	– Patient Standing	Check BP Check Rhomberg's
	– Patient walking to couch	Observe gait, posture and footwear
	– Patient lying	Full physical exam; emphasis on cardio-vascular, neurological and musculoskeletal
5) Investigations		Relevant blood tests Chest X-ray ECG with carotid sinus massage 24 hours ECG Cervical spine X-ray
6) Referral for para-medical assessment and therapy		Physiotherapy Mobility assessment Occupational therapy Environment assessment

If the problem appears to be related to postural imbalance, then Parkinson's disease, normal pressure hydrocephalus and cerebellar degeneration need exclusion.

Myopathies and arthropies may present as reccurent falls and alcohol abuse has also to be borne in mind.

Once a diagnosis has been established clinically (Table II), confirmatory investigations should be considered. Treatment should be instigated when appropriate and should include referral to the physiotherapist. Restoration of self confidence is an important part of recovery. It may not be possible to overcome all the problems and the individual may remain at risk of further falls. In these instances each individual should be taught how to get up from the floor safely.

Regaining confidence is of paramount importance. Loss of confidence leads to further loss of mobility and independence.

Alarm systems when available may provide reassurance and increase self confidence.

Recurrent falls need prompt evaluation, appropriate investigation and enthusiastic positive therapy.

References

1. Exton-Smith AN. Clinical Manifestations. In: Exton-Smith AN, Grimley Evans J. eds. Care of the Elderly, Meeting the Challenge of Dependency. London: Academic Press 1977: 41-52.
2. Sheldon JH. On the natural history of falls in old age. Br Med J 1960;2:1685-90.
3. Overstall PW. Prevention of falls in the elderly. J Am Geriatric Soc 1980; 28:481-4.
4. MacDonald JB. The role of drugs in falls in the elderly. Clin Geriatr Med 1985;3:621-36.
5. Isaacs B. Clinical and laboratory studies of falls in one people. Clin Geriatr Med 1985;3:513-24.
6. Archea JC. Environmental factors associated with stair accidents by the elderly. Clin Geriatr Med 1985;3:555-70