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## **Falls Prevention**

*Falls are twice as likely to occur with dementia, with the incidence of serious injury three times that for normal elderly. Such falls can be prevented with a greater understanding of the nature of falls within this population, a knowledge of the special risk factors involved, and the establishing of prevention strategies.*

*Compiled by Editorial staff\**

# **Reducing dementia-related falls**

## **Residents with dementia display much greater impairments of gait and balance**

**T**he annual incidence of falls in patients with dementia is twice the rate of the cognitively normal elderly population (Tinetti et al., 1988). Serious injury is more common in those with dementia, with one-quarter of those falling sustaining a fracture, which is three times the age-adjusted figure for expected fracture incidence (Tinetti et al., 1988; Oleske et al., 1995; Buchner, 1987).

### **Poor prognosis**

In addition, patients with dementia who fall have a poorer prognosis than cognitively normal elderly fallers. Also, they are less likely to make a satisfactory recovery from injury (Baker et al., 1978), five times more likely to be institutionalized (Morris et al., 1987) and, after fracture of the neck of the femur, experience a 6-month mortality of 71% - more than three times that of the cognitively intact (Baker et al., 1978).

It is often assumed that falls are a

normal part of dementia, that patients with dementia will be unable to cooperate with investigations, that there is no effective treatment for falls in dementia and that, even if there was, patients would be unable to cope with the necessary interventions.

The prevalence of dementia is approximately 5% of the population aged over 65 and 15% of those aged over 80; and, with changes in aging demographics (Ebrahim, 1995), falling is a problem that cannot be ignored.

### **Failing mechanisms**

People with dementia fall due to a variety of causes. The human body, for example, is inherently unstable, with complex regulatory mechanisms required to maintain the upright position and prevent falls. These mechanisms begin to fail with normal aging, as manifest by abnormalities of gait and balance (Isaacs, 1978).

Patients with dementia, however, display much greater impairments of

gait and balance compared with age- and sex-matched normal controls; these impairments are more marked in those with dementia who fall (Buchner et al., 1987).

The abnormalities in gait and balance that are observed in patients with dementia are probably accounted for by impairments due to structural and neurochemical degeneration caused by the dementing process (Isaacs, 1978).

### **Medications**

Medications, particularly benzodiazepines, phenothiazines and antidepressants, have been implicated as a risk factor for falls in patients with dementia (Thapa et al., 1995); via the proposed mechanisms of central sedation, orthostatic hypotension and extra-pyramidal side-effects (Wynne, et al., 1996). [See glossary of terms]

Prescribing these medications doubles the risk of falls in both cognitively impaired and in patients

with advanced dementia. Although this doubling of fall risk could be caused by the dementia process itself (Sattin, 1992), the increased fall risk is probably independent of dementia, since the same doubling of risk in falls is still found in cognitively normal patients (Sattin, 1992; Thapa, 1995; Wynne, 1996).

### Lewy body dementia

A specific interaction between medication and dementia does, however, occur in Lewy body dementia (McKeith & Perry et al., 1992; McKeith and Fairbairn et al., 1992). Phenothiazines cause adverse reactions in 80% of patients with Lewy body dementia, with approximately 60% experiencing severe neuroleptic sensitivity associated with increased mortality (McKeith and Fairbairn, 1992.).

Cardiovascular disorders are attributable causes of falls that are important because most are amenable to treatment and prevention.

Orthostatic hypotension (McIntosh et al., 1993) is implicated in falls

caused by medication prescribed in dementia and may be part of autonomic dysfunction in Lewy body dementia (McKeith and Fairbairn, 1992). Failure of the autonomic nervous system could perhaps account for the increased number of recurrent and unexplained falls found in patients with Lewy body dementia. Carotid sinus hyper-sensitivity (McIntosh et al., 1993) is more common in patients with fractured necks of femur (36%) - both cognitively impaired and cognitively normal - than in patients admitted acutely for reasons other than falls (17%) or frail day-hospital attendees (13%) (Kenny et al., 1996).

In the patients with fractured necks of femur, those who had carotid sinus hypersensitivity had a lower cognitive score than those who did not, suggesting a possible association between dementia, carotid sinus hypersensitivity and falls. In addition, patients with dementia are less likely to recall a history of syncope (Cummings et al., 1998), resulting in the diagnosis of carotid sinus hypersensitivity being missed and remaining untreated.

The environment may be a *specific* risk factor for falls in patients with dementia (Oleske, 1995), although evidence to support this remains unclear (Clemson et al., 1996). There are no major studies on the relative contributions of environmental factors to falls in dementia. Preliminary data in a study of 30 patients with cognitive impairment and dementia who attended accident and emergency departments after falling, found impairments of gait and balance in 93% of these patients:

- medication was a factor in 37%;
- cardiovascular disorders, 43%; and
- possible contribution from environment, **only 13%** (Shaw et al., 1997).

### Multifaceted

Is it possible to prevent falls in patients with dementia? In view of the multi-factorial nature of falls in those with dementia, a successful intervention strategy to reduce falls would need to be multi-disciplinary and address the risk factors and specific causes of falls identified as being important in dementia. There are few published studies to date of intervention of this type in patients with dementia who fall.

However, in cognitively normal patients, interventions to modify the risk factors and specific causes of falls found to be important in dementia, have been successful.

A controlled trial of a multi-factorial intervention strategy to treat orthostatic hypotension, improve impairments of gait and balance, rationalize medications implicated in falls, and modify environmental hazards, reduced the number of people falling in the intervention group by 31% in one year (Tinetti et al., 1994).

Treatment of cardiovascular disorders is perceived to be beneficial by 76% of patients (McIntosh et al., 1993), and a smaller study suggests the insertion of permanent pacemakers prevents unexplained falls in cardio-

### Glossary of terms

**Syncope** is the reversible loss of consciousness and postural tone, resulting from a sudden decrease in cerebral perfusion. This decrease in nutrients and oxygen to the brain is temporary. It is distinct from coma, seizures, shock, vertigo, and other states of altered consciousness. Syncope results from inadequate delivery of oxygen or glucose to the brain. Unlike other tissue in the body, brain tissue does not store energy; thus, a relatively short interruption in cerebral perfusion will result in syncope. Most episodes are benign, *unless a falling incident occurs*.

**Extra-pyramidal side-effects or symptoms (EPS)** refers to a group of side effects associated with antipsychotic medications. These side-effects include parkinsonism, akathisia (uncontrollable restlessness), dystonia (impaired muscle tonicity) and tardive dyskinesia or TD, (slow, stereotyped muscle movement).

**Orthostatic (or postural) hypotension** refers to a decrease in (systolic and diastolic) blood pressure upon suddenly arising from a recumbent position or from standing still. A common and potentially dangerous condition for the elderly, orthostatic hypotension is often accompanied by dizziness and falls.

**Carotid sinus hypersensitivity** is excessive or abnormal sensitivity of the carotid sinus, an enlargement in the neck where the carotid artery divides into the internal and external carotid arteries. The carotid sinus functions to monitor and regulate heart rate and blood pressure. ■

inhibitory carotid sinus hypersensitivity (Kenny and Traynor, 1991).

Could a multi-disciplinary intervention strategy prevent falls in patients with dementia? Physiotherapy, which would clearly form an important part of such a strategy, has been shown in a small pilot study to improve or maintain the mobility skills of patients with severe dementia (Pomeroy, 1993), although these were not patients who had fallen.

It is feasible to apply a multidisciplinary assessment and intervention strategy incorporating physiotherapy, minimization of environmental fall hazards, modification of medications and cardiovascular interventions in fallers with dementia. There are, however, no published data on the success of this approach in preventing falls in patients with dementia (Shaw et al., 1997).

## Conclusion

Falls are a cause of substantial morbidity and mortality in residents/patients with dementia. Impairments of gait and balance, medication, cardiovascular problems, and the environment, can all contribute to falls in this group. Treatment of these (impairments or deficits, etc.) reduces falls in cognitively normal elderly patients. Multi-disciplinary intervention to modify these risk factors for falls is feasible in patients with dementia, although data on effectiveness in preventing falls are unavailable, as of this writing.

As the population ages, the prevention of falls in those with dementia is becoming increasingly important at both the individual level and as a wider health care issue.

The hospitalization and institutionalization costs incurred as a result of falls are huge (Sattin, 1992). While ethical considerations may result in a reluctance to undertake research in patients with dementia, recent discussion has produced a framework

within which this can occur (Berghmans et al., 1995; Kitwood, 1995). We should accept the challenge of such work in a high-risk and often neglected group of patients and support and encourage research into prevention of falls in those with cognitive impairment and dementia. ■

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