COMMENTARY

Can falls in patients with dementia be prevented?

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Introduction

The annual incidence of falls in patients with dementia is 40-60% [1, 2], twice the rate of the equivalent cognitively normal elderly population [1]. Serious injury is more common and one-quarter of patients with dementia who fall sustain a fracture: three times the age-adjusted figure for expected fracture incidence [1, 3, 4]. In addition, patients with dementia who fall have a poorer prognosis than cognitively normal elderly fallers. They are less likely to make a satisfactory recovery from injury [5], five times more likely to be institutionalized [2] and, after fracture neck of femur, have a 6-month mortality of 71%—more than three times that of cognitively intact patients [5].

It is often assumed that falls are a normal part of the dementing process, that patients with dementia will be unable to co-operate 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 in the UK is about 5% of the population aged over 65 and 15% of those aged over 80 [6, 7]. With changes in ageing demographics [8], the problem of falls in patients with dementia cannot be ignored.

Why do patients with dementia fall?

The human body is inherently unstable and complex regulatory mechanisms are required to maintain the upright position and prevent falls [9]. These mechanisms begin to fail with normal ageing, as manifest by abnormalities of gait and balance [9]. Patients with dementia display much greater than expected impairments of gait and balance compared with age- and sex-matched controls [10], and these impairments are more marked in patients with dementia who fall [4].

The abnormalities in gait and balance observed in patients with dementia are probably accounted for by impairments of central processing as a consequence of structural and neurochemical degeneration caused by the dementing process [9, 10].

Medications, particularly benzodiazepines, phenothiazines and anti-depressants, have been implicated as a risk factor for falls in patients with dementia [1, 3, 4, 11, 12], via the proposed mechanisms of central sedation, orthostatic hypotension and extra-pyramidal side-effects [13]. Prescription of these classes of medication doubles the risk of falls in both cognitively impaired and demented patients [11, 12]. Although this could be caused by a specific interaction with the dementia process [14], the increased fall risk is probably independent of dementia, as controlling for confounding by cognitive impairment and dementia results in the same doubling of risk in falls, which is still found in cognitively normal patients [11, 12]. A specific interaction between medication and dementia does, however, occur in Lewy body dementia [15, 16]. Phenothiazines cause adverse reactions in 80% of patients with Lewy body dementia, 50-60% of whom experience severe neuroleptic sensitivity associated with increased mortality [15, 16].

Cardiovascular disorders are attributable causes of falls that are important because most are amenable to treatment. Orthostatic hypotension [17] is implicated in falls caused by medication prescribed in dementia [13] and may be part of autonomic dysfunction in Lewy body dementia [15]. 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 [15]. Carotid sinus hypersensitivity [17] 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%) [18, 19]. 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 [20], 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 [3], although evidence to support this remains unclear [21].

There are no major studies on the relative contributions of these factors to falls in dementia. Preliminary data from 30 patients with cognitive impairment and dementia who attended accident and emergency departments having fallen, found impairments of gait and balance in 93%, medication as a contributing factor in 47%, cardiovascular disorders in 53% and possible contribution from the environment in 13% [22].

Is it possible to prevent falls in patients with dementia?

In view of the multi-factorial nature of falls in patients 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 no published studies 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 randomized 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% at 1 year [23]. Treatment of cardiovascular disorders is perceived to be beneficial by 76% of patients [17] and a small study suggests the insertion of permanent pacemakers prevents unexplained falls in cardioinhibitory carotid sinus hypersensitivity [24].

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 [25], although these were not patients who had fallen. It is feasible to apply a multi-disciplinary assessment and intervention strategy incorporating physiotherapy, minimization of environmental fall hazards, modification of medications and cardiovascular interventions in fallers with dementia [22]. There are, however, no published data on the success of this approach in preventing falls in demented patients.

**Conclusion**

Falls are a cause of substantial morbidity and mortality in patients with dementia. Impairments of gait and balance, medication, cardiovascular problems and the environment can all contribute to falls in this patient group. Treatment of these 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 as yet unavailable. As the population ages, the prevention of falls in patients with dementia is becoming increasingly important at both the individual patient level and as a wider health service issue. The hospitalization and institutionalization costs incurred as a result of falls are huge [14] and the contribution from fallers with dementia will increase. While ethical considerations may result in a reluctance to undertake research in demented patients, recent discussion has produced a framework within which this can occur [26-28]. 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 patients with cognitive impairment and dementia.

**References**

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