

Preventing Accidental Falls among Older People in Long Stay Units

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Abstract

A fall prevention programme for older long-stay patients in a 95 bedded District Hospital was undertaken. Data on falls and resulting injuries for the year prior to the intervention were compared with equivalent data after one year (Year 1) and after two years (Year 2) of the intervention. In the pre-intervention year 25% of patients had at least one fall compared with 20.9% and 17.4% in Year 1 and Year 2 respectively. This difference was not statistically significant. However, there were 21% fewer falls in Year 1 and 49.3% fewer in Year 2 than in the pre-intervention year. This difference was significant in Year 2. In both intervention years there was a significant reduction in the incidence of fracture from 20.5% of falls (pre-intervention) to 2.8% in Year 1 and no fractures occurred in Year 2. Significant reductions in soft tissue injuries occurred in Year 2 but not in Year 1, dropping from 38.5% (pre-intervention) to 36.1% and 15.4% respectively. The percentage of patients uninjured after a fall increased from 41% to 61.1% to 84.6%. This intervention reduced falls and their adverse consequences for older people living in the long stay unit. The effect of the intervention escalated in Year 2. The intervention cost IR£4,800. Fall prevention should be part of the routine care of older people in all types of long stay care.

Introduction

Falls are common in older people (65 years and over) and are associated with considerable morbidity (1, 2). Prevention is important. Of older people living in the community, 30% fall each year (3) and at least 10% of them sustain a serious injury from a fall such as a fracture, joint dislocation or severe head injury (2). The risk of falling is higher among elderly hospitalised patients (4).

Each year in Ireland approximately 280 people die from accidental falls and more than 75% of these are over 65 years (5). Of the 8,000 older people hospitalised annually due to injury, falls cause 80% of those admissions. Furthermore, 35% of all injury admissions in this age group are because of lower limb fractures of which three-quarters are to the hip (6). The Irish Public Health Information System (PHIS) documents approximately 3,000 hospital discharges per year after treatment for hip fracture in people over 65. Their average length of hospital stay is 14 days (7). The approximate acute hospital cost of treating a hip fracture is IR£4,500 (6).

We undertook a safety promotion programme in a District Hospital. The aim was to develop and implement a fall prevention strategy for the elderly patients and to improve safety awareness among the patients and staff.

Baltinglass District Hospital is in West Wicklow. It has 95 beds and provides long-term health services for older people. It also provides assessment and rehabilitation, respite, day care and terminal care. The average patient age is 81 years. The bed occupancy rate is approximately 90% with about 150 admissions per year. Patients have various levels of dependency, for example, during 1999, 42 patients (50.6%) needed assistance with dressing, 27 (32.5%) were immobile, 22 (26.5%) needed help with feeding and 27 (32.5%) were doubly incontinent.

Methods

We compared the rate of falls and resulting injuries after one year, October 1998-September 1999 (Year 1), and after two years, October 1999 - September 2000 (Year 2), of an intervention programme with those of the pre-intervention year, June 1997 - May 1998. During each time period data were compiled in the same way and from the same source by using the standard 'Incident Report Forms' in which details of all injuries are to be documented at the time of occurrence. A copy of the 'Incident Report Forms' is retained by the hospital.

During the summer months of 1998 preparation for the intervention took place. Staff attended a lecture and a workshop on the consequences of falling for older people and on effective ways to improve safety. The views of all staff regarding safety and remediable environmental hazards in the hospital were obtained by questionnaire and corrective action was taken, where possible.

An occupational therapist conducted an environmental audit of the hospital. Her recommendations on reducing hazards were implemented. As a result handrails were installed on corridors together with grab rails and arm rests in bathrooms. The policy of polishing floors was discontinued. More suitable chairs with armrests replaced low chairs. In general, environmental changes were tailored to the needs of patients. For example, commodes without wheels had to be acquired for a small group of patients who persistently used the wheel-bearing variety as an aid to moving about. Such patients tended to tilt forward from the commode and fall. Obstructive furniture, particularly tables in the centre of wards, was removed. Men's trousers were fitted with braces to limit the risk of tripping. Emergency patient call bells were checked and repaired where necessary. Special rubber tiling was fitted in an outdoor patio area frequented by the patients.

Risk factors for falling, intrinsic to each patient, were assessed and corrective action was taken where possible e.g. remediable visual problems, mobility assistance and replacement of unsuitable footwear or provision of special footwear. Each patient's medication was examined with a view to avoiding polypharmacy and to minimise the use of medications that could cause or contribute to unsteadiness. A Fall Risk Assessment Scale, already developed and used in another Irish hospital, was adapted to identify patients at high risk of falling (8). Risk of falling was categorised as either low, medium or high by assessing certain patient characteristics such as, gender, age, gait, sensory deficit, history of falling, medication, medical history, current medical condition and mobility. A risk score was calculated for each patient. Those identified as being at high risk of falling were provided with hip protector pads and encouraged to wear them i.e. patients with an already damaged hip, recurrent fallers and patients with an unsteady gait. Where possible, a profile of repeat fallers was prepared, including the places and times at which a fall was most likely, so that anticipatory action by staff could be planned.

The Chi Square Test and Fisher Exact Test were used, as appropriate, to compare data.

Results

In the pre-intervention year 156 patients were treated as inpatients and 39 (25%) of them sustained a total of 71 falls. During Year 1 of the intervention 172 patients were treated as inpatients and 36 (20.9%) sustained a total 56 falls. In Year 2, 149 patients were treated as inpatients and 26 (17.4%) sustained a total of 36 falls.

Table 1 shows where the falls occurred during the pre-intervention and the two intervention years. The most common place was in the ward / bedroom area (35.2% v 50% v 61.2%) followed by the bathroom / toilet (19.7% v 14.3% v 13.9%) and the dayroom (14.1% v 16% v 8.3%). The only significant change was that more falls occurred in the ward / bedroom in Year 2.

The circumstances of the fall are shown in Table 2. The main recognisable factors were slipping or tripping while walking (26.8% v 23.2% v 22.2%) and getting into or out of bed (22.5% v 19.6% v 16.7%). In approximately 21% of cases overall the patient was found on the floor following the fall and the precise circumstances of the fall were not recorded. Seven of these patients had reported feeling weak or unsteady prior to falling and in three cases there appeared to be no precipitating factor - these patients described their legs as simply “going from under them”. There was no significant difference in the circumstances of a fall between the pre-intervention and intervention years.

Table 3 gives a profile of patients who fell. Mean patient age was similar in each time period, 83.5 v 82.6 v 84 years. In the pre-intervention year 64.1% of the patients were females compared with 47.2% in Year 1 and 57.7% in Year 2; the difference was not significant. Over half of patients in each group had a history of falling 53.8% v 61.1% v 57.7%. Approximately half of the were at low risk of falling, 56.4% v 41.7% v XX% though a further 23.1% and 36.1% and XX% in each group respectively were considered at high risk. There was no significant difference in the risk of falling between the pre-intervention and intervention periods. Though the number of patients wearing hip protectors fluctuated from time to time, all patients designated at ‘high risk’ were encouraged to wear them.

Table 4 gives details of the falls sustained and their consequences. In the pre-intervention year there were 71 falls among 39 (25%) of the 156 inpatients treated in the hospital. Twenty-three (59%) of these patients (14.7% of all patients in the hospital) were injured, sustaining a total of 27 injuries. Eight of the patients who fell (20.5%) sustained a fracture (six hips, one pelvis and one humerus). The remaining 15 (38.5%) patients sustained soft tissue injuries. Sixteen patients (41%) were uninjured after a fall.

During Year 1 of the intervention there were 56 falls among 36 (20.9%) of the 172 inpatients treated in the hospital. Fourteen (38.9%) of these patients (8.1% of all patients in the hospital) were injured, sustaining a total of 19 injuries. Only one patient who fell (2.8%) sustained a fracture (hip). The remaining 13 (36.1%) received soft tissue injuries. Twenty-two patients (61.1%) were uninjured after a fall.

During Year 2 of the intervention year there were 36 falls among 26 (17.4%) of the 149 inpatients treated in the hospital. Four (15.4%) of these patients were injured

(2.7% of all patients in the hospital), sustaining one injury each. All the injuries were soft tissue. Twenty-two patients (84.6%) were uninjured after a fall.

In an effort to assess whether the pre-intervention year was representative of other years, the number of falls for the year preceding the pre-intervention year were also examined (June 1996-May 1997). There were 79 falls recorded for that year resulting in 20 minor injuries and five fractures for a similar population of patients treated at the hospital. No significant differences were found in the occurrence of minor injuries or fractures between these two pre-intervention years.

Discussion

Falls and resulting injuries were reduced among older patients in this long-stay unit. Staff considered that the critical success factors were their awareness of the serious consequences of a fall for older people, their knowledge of remediable risks and ability to identify and reduce these risks.

Falls in older people are preventable and this is essential because of the physical and psychological incapacity they cause (9,10,11, 12, 13, 14). Up to two-thirds of older women living in nursing homes fall at least once a year (15,16,17). Falls amongst this group are more frequently associated with serious injury and death (17,18, 19). Only 50% are alive one year after a serious injury (20) and only one-third return to their previous level of activity (21). Over 50% of the patients in this long stay hospital had a history of falling. These high rates probably reflect the poorer health status of institutionalised older people, the pressure on recurrent fallers to enter a long stay unit and an increased risk of falling due to unfamiliar environments.

Modifying risk factors, as undertaken in this study, can reduce falls and fractures. A systematic review of effective methods of prevention found that simple exercises to improve muscle strength, hip protector pads for frail older people, correcting vision and ensuring sensible prescribing were effective in reducing falls (22). Attention to environmental (extrinsic) risks, for example, loose carpets, absence of grab rails and poor lighting is important (4). High dose vitamin D supplements with or without calcium appears to be effective (22), however dietary modification was not part of this study.

Compared with other research, the baseline figure for the proportion of patients who fell in a year (25%) appears low (3). This is unlikely to be due to under-recording given the importance of the 'Incident Report Form' in the event of legal action being taken by an injured person. In addition previous years' data were similar. It is, therefore, possible that this hospital had a low rate of falling at the outset, that other institutions may have higher rates and consequently may benefit even more from a fall prevention programme. Though the proportion of people who fell during the intervention years reduced to 20.9% and 17.4% respectively, the difference was not significant. However, the total number of falls dropped by 21.1% in Year 1 and by a significant 49.3% in Year 2 even though patients' risk of falling did not alter. Likewise the incidence of falling per bed per year reduced from 0.75 to 0.58 (Year 1)

and 0.38 (Year 2). Other research indicates that the mean incidence of falls in nursing homes is 1.5 per bed per year, range 0.2-3.6 (23).

The overall rate of injury at the baseline was high, possibly an indication of the degree of frailty of patients in long-stay hospitals though it reduced during the intervention from 59% to 38.9% (Year 1) and to 15.4% (Year 2). The incidence of fracture in the pre-intervention year was also high with one in three patients injured in a fall sustaining one compared with only one person of the 14 injured during the Year 1 and none during Year 2. It is unclear which of the interventions used in this study produced the greatest effect and further research is needed in this regard. However, in a meta analysis of strategies to prevent fractures in nursing home residents the risk of hip fracture was halved in persons wearing hip protectors (24).

The place and circumstances of the falls are not surprising. Most happened in the ward / bedroom area, usually when patients were getting into or out of bed. Stumbling or tripping were the main precipitating factors. Focusing preventive efforts in these areas may reap the best rewards.

Falling in older people impacts, not only on the patient and family, but also on the health service. Given the large projected population increase for older people over the next 10 years more falls and fractures are expected. The cost of hip fracture treatment in Ireland is estimated at IR£15 million to our health service annually with 50,000 acute bed-days being used for treatment (7). This figure will escalate unless efforts are made to reduce falls. This hospital incurred an additional expense of IR£4,800 in making the recommended environmental changes to improve safety - similar to the acute hospital cost of treating just one hip fracture. Prevention has to be a most worthwhile investment.

We recommend that fall prevention be prioritised as part of the routine care of all long-stay elderly hospitalised people, including those in nursing homes. Intrinsic risk factors for each patient should be identified and methods to overcome them implemented, where possible. Environmental (extrinsic) risk factors should be regularly monitored in all institutions and corrective measures undertaken.

Table 1 Place of the fall

Place of fall	Pre-intervention	Year 1 Intervention	Year 2 Intervention
	June 1997-May 1998	Oct 1998-Sept 1999	Oct 1999-Sept 2000
	No. (%)	No. (%)	No. (%)
Ward / bedroom	25 (35.2)	28 (50)	22 (61.2) **
Bathroom / toilet	14 (19.7)	8(14.3)	5 (13.9)
Dayroom	10 (14.1)	9 (16)	3 (8.3)
Corridor	7 (9.9)	2 (3.6)	3 (8.3)
Outdoors	3 (4.2)	1 (1.8)	0
Not stated	12 (16.9)	8 (14.3)	3 (8.3)
Total falls	71 (100)	56 (100)	36 (100)

* p<0.05

**p<0.01

Table 2 Circumstances of the fall

Circumstances of the fall	Pre-intervention	Year 1 Intervention	Year 2 Intervention
	No. (%)	No. (%)	No. (%)
Slipped/tripped while walking	19 (26.8)	13 (23.2)	8 (22.2)
Getting in / out of bed	16 (22.5)	11 (19.6)	6 (16.7)
Found on the floor: circumstances of fall not obvious	15 (21.1)	11 (19.6)	9 (25)
Fell off chair	7 (9.9)	11 (19.6)	3 (8.3)
Fell in bathroom / off toilet or commode	7 (9.9)	5 (9.0)	8 (22.2)
Tripped over obstacle	6 (8.4)	2 (3.6)	1 (2.8)
Other	1 (1.4)	3 (5.4)	1 (2.8)
Total	71 (100)	56 (100)	36 (100)

* p<0.05

**p<0.01

Table 3 Profile of patients who fell

Patient profile	Pre-intervention	Year 1 Intervention	Year 2 Intervention
	N=39 No. (%)	N=36 No. (%)	N=26 No. (%)
Age: Mean age (years)	83.5	82.6	84
Age range (years)	65-95	65-98	71-95
Sex: Male	14 (35.9)	19 (52.8)	11 (42.3)
Female	25 (64.1)	17 (47.2)	15 (57.7)
History of falling	21 (53.8)	22 (61.1)	15 (57.7)
Risk of falling: Low	22(56.4)	15 (41.7)	10 (38.5)
Medium	8 (20.5)	8 (22.2)	7 (26.9)
High	9 (23.1)	13 (36.1)	9 (34.6)

* $p < 0.05$

** $p < 0.01$

Table 4 Falls and resulting injuries

Injury	Pre-intervention	Year 1 Intervention	Year 2 Intervention
	N=156	N=172	N=149
	No. (%)	No. (%)	No. (%)
Number (%) of patients who fell in hospital	39 (25)	36 (20.9)	26 (17.4)
Number (%) of patients injured	23 (14.7)	14 (8.1)	4 (2.7) **
Number of falls sustained	71	56	36
Falls per bed:	0.75	0.59	0.38
Number (%) of falls resulting in injury	27 (38)	19 (33.9)	4 (2.7) **
Consequences of the fall for the patient:	N=39	N=36	N=26
No injury	16 (41)	22 (61.1)	22 (84.6) **
Minor injury (soft tissue) only	15 (38.5)	13 (36.1%)	4 (15.4) **
Fracture	8 (20.5)	1 (2.8) **	0 **

* **p<0.05******p<0.01**

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