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A Profile of Elderly Fallers Referred for Physiotherapy in the Emergency Department of a Dublin Teaching Hospital

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Abstract

Ireland has an ageing population and the elderly are over-represented in Emergency Departments (ED) - a quarter of these presentations resulting from falls. A prospective study design was employed using a convenience sample to profile elderly fallers referred for physiotherapy in ED. Forty-subjects were assessed over 14 weeks. Mean age was 84.88 years (s.d. 7.3) and 31 (77.5%) were female. All demonstrated slow walking speed and 26 (65%) demonstrated poor grip strength. A quarter of subjects reported fear of falling and 30 (75%) were classified as frail. Elderly fallers in ED are a frail group of socially vulnerable patients who demonstrate a risk of further falls. Osteoporosis had been diagnosed in 9 (22.5%) subjects – a low prevalence compared with international research, but 25 (62.5%) subjects had never had a DEXA scan. The prevalence of frailty in the sample of elderly fallers in this study was very high (75%).

Introduction

Ireland like many other countries has seen a steady increase in life expectancy and has an ageing population¹. A recent study demonstrated that 11% of the Irish population were aged 65 or older and 2.7% were over 80 years of age². There will be a projected 44% increase in the number of people over 65 in the next ten years. The greatest increase will occur in the over 80 population with the number in this group expected to double between 2011 and 2031³. A better understanding of healthcare need and utilisation of services among the elderly Irish population is essential for policy planning³.

A fall has been defined as "inadvertently coming to rest on the ground, floor or other lower level, excluding intentional change in position to rest in furniture, wall or other objects"⁴. The consequences of falls in the elderly population can be severe and include hospitalisation, nursing home placement, and changes in health status, social isolation and increases in morbidity and mortality⁵. Falls are common in the community dwelling elderly population with 30% of this cohort falling in a one-year period⁶. In 2008, the Health Service Executive (HSE) reported that 50% of people who are 80 years or more fall each year⁷. It has been reported that older people are over-represented in Emergency Departments (ED) in Ireland and 17% of all ED presentations are accounted for by the over 65 year old age group⁷. Fallers account for up to a quarter of this population⁸ and so the management of fallers in ED is an important issue. The ED offers healthcare professionals an excellent opportunity to identify elderly fallers and those at risk of falls. The aim of this study was to describe the profile of community dwelling adults over 65, who were referred for physiotherapy in the Emergency Department (ED) of a Dublin Teaching Hospital after a fall.

Methods

St Vincent's University Hospital is one of the Dublin Academic Teaching Hospitals with 479 in-patient beds. There is a 24-hour ED catering for patients over the age of 14. A prospective, observational study design was used in the ED of St Vincent's University Hospital, Dublin. Inclusion and exclusion criteria were developed by liaising with the senior physiotherapist, physiotherapy manager, research supervisor, Clinical Nurse Specialist (CNS) and consultants in the relevant area. Patients over 65 who had been referred for physiotherapy in the ED after a fall as defined by WHO4 were included and the Senior Physiotherapist in ED, who acted as a gatekeeper, identified potential subjects. Patients with an Abbreviated Mental Test Score (AMTS) of below 6 were excluded. St Vincent's Research Ethics Committee granted ethical approval.

Subjects were interviewed about fall details, falls history, fracture history, osteoporosis, visual impairment, footwear, assistive devices, previous physiotherapy involvement, fear of falling, steadiness, environment, markers of frailty and urinary incontinence. Demographic data and history were established from the medical charts. The Timed Up and Go (TUG) test⁹ was assessed as a measure of gait speed and falls risk and grip strength was assessed using a Jamar dynamometer. The validity and reliability of these outcome measures have been described previously^{9,10}. During the TUG, subjects were asked to rise from a chair of 46cm with armrests¹¹ walk 3m and return to chair, at their normal gait speed using usual gait aid and footwear. Activity was timed and compared to age and gender normative values¹².

Results

Demographic Profile

There were 40 subjects recruited over a 14-week period with an age range from 67 to 99 and a mean age of 84.88 (s.d. 7.3) years. During that period a further 8 elderly fallers had left the department before assessment, 4 patients were excluded due to a diagnosis of collapse rather than fall. Three patients were excluded due to poor cognition and 3 refused to participate. The majority of subjects were female and only 9 (22.5%) subjects were male. Many of the participants lived alone (72.5%) and half used a frame to mobilise. There were 9 (22.5%) subjects who had been diagnosed with osteoporosis but only 15 (37.5%) had ever had a DEXA scan. Of the elderly fallers who were referred to physiotherapy service in ED, over three quarters (77.5%) were admitted to hospital. Only four subjects (10%) were discharged home from ED. Nearly one third (37.5%) of this population denied a previous fall. Only 3 (7.5%) of the subjects did not use a mobility aid and over half used a frame to mobilise. However, only 9 (22.5%) subjects reported that a physiotherapist had provided their mobility aid. The same percentage reported that family had provided the mobility aid.

Table 1 Prevalence of Falls Risk Factors

N=40	Number (%)
TUG speed below normal	40 (100)
Dependant on mobility aid	37 (92.5)
Polypharmacy	31 (77.5)
Stairs at home	30 (75)
Living alone	29 (72.5)
CNS Meds	28 (70)
Grip Strength below normal	26 (65)
Previous falls	25 (62.5)
Visual deficit	23 (57.5)
Urinary Incontinence	22 (55)
Recent change in activity levels	22 (55)
Fear of falling	10 (25)
No bedside light	4 (10)

Details of Falls

The most frequent location of the falls was indoors as 33 of the subjects (82.5%) fell indoors. The majority of subjects (65%) sustained an injury after the fall. The most common injury was bruising (12.5%) followed by Colles fracture and pelvic fracture (10%). Head lacerations (7.5%) and humeral fractures (7.5%) were also prevalent. Over 40% of the falls happened between 10am and 12 noon and only 20% of falls happened between the hours of 10pm and 6am. Slippers were the most frequent footwear worn at the time of fall (35%) followed by walking shoes (30%). There were 5% of subjects who were barefoot at the time of fall and a further 5% who were wearing only socks.

Falls Risk Profile

There were thirteen risk factors for falls included in this study. Study subjects displayed 8-12 of these risk factors and the mean was 8 risk factors (s.d. 1.9). There were 10 (25%) subjects who reported fear of falling. Of these subjects, seven acknowledged that they restricted their activity. A summary of prevalence of falls risk is summarised in Table

Frailty

Frailty was assessed based on Fried's classification¹³. Grip strength data was analysed for subjects' dominant upper limb and compared to normative data¹⁴. For four subjects, dominant upper limb grip strength could not be assessed due to radial fracture, humeral fracture or severe gout. In these cases the non-dominant reading was analysed. There was 65% of the population that had grip strength below normal values for their age and gender¹⁵. A high percentage of subjects (37.5%) were unable to complete the TUG test as they required assistance to stand from chair or assistance to mobilise. Of those who did complete the TUG, the mean time taken to complete the test was 45.95 (s.d. 34.081) seconds ranging from 15 to 140 seconds. All of the subjects required longer to complete the TUG than aged matched controlled community dwelling adults¹³. A summary of the frequency of markers of frailty is shown in Table 2. All of the subjects displayed slow walking speed, the majority displayed weak grip strength (65%) but just over a third (35%) reported un-intentional weight loss.

N=40	Number (%)
Slow Walking Speed	40 (100)
Decreased Grip Strength	26 (65)
Self-reported Exhaustion	22 (55)
Inactivity	21 (52.5)
Un-intentional Weight Loss	14 (35)

Thirty (75%) of the subjects in this study were classified as frail based on Fried's classification¹³. It was calculated that the mean number of markers displayed was 3 (s.d. 1.2). Two of the subjects did not display any markers of frailty but three displayed all five markers. There were 4 (10%) subjects who were classified as non-frail and 6 (15%) who were classified as pre-frail. An independent t-test found that there was no difference in number of falls in the preceding year between those who were classified as frail or not frail ($t=-0.244$, $df=38$, $p=0.809$).

Discussion

Comparison with previous studies shows that elderly fallers referred for physiotherapy in ED were older, and more socially vulnerable than the general ED elderly population in the same setting. Previous studies have reported mean age of elderly ED presentations to be 75.8 years¹⁶ or 76.35 years⁸. It has been found that fallers in ED were significantly older (mean age of 79 years) than non-fallers¹⁷. Further study would be required to establish if elderly fallers referred for physiotherapy in ED are older than the fallers who are not referred for physiotherapy.

The frequency of living alone for elderly patients who present to ED was previously shown to be 42%⁸. However 72.5% of subjects in this study lived alone indicating that fallers referred for physiotherapy in ED are a group of socially vulnerable elderly. There were 22.5% of the subjects in this study who had been diagnosed with osteoporosis. However research has shown that 40-50% of women and 25% of men are likely to develop osteoporosis¹⁶ suggesting that osteoporosis may be under-diagnosed in this population. Only 7.5% of the subjects in this study were independently mobile and half used a frame. Of those who had a mobility aid, only 22.5% reported getting it from a physiotherapist and the same percentage reported that a family member had provided the mobility aid. This suggests that there may be an unmet need for this group of subjects who may never had any intervention by a physiotherapist despite a decline in mobility. Further study in this area seems warranted.

The profile of the subjects in this study is of a frail group. Three quarters were classified as frail according to Fried's classification system and in total 90% were classified as frail or pre-frail. Previous studies have documented a frailty prevalence of 6.9% in the community dwelling elderly⁸. Therefore, the prevalence of frailty in the population of elderly fallers referred for physiotherapy in ED is higher than in community dwelling elderly population¹⁸. There were 65% of this study cohort who displayed decreased grip strength than age and gender matched controls, and therefore were more at risk of disability and mortality¹⁹. A high percentage of subjects were unable to complete TUG. Previous research has advised that inability to complete the TUG is more predictive of falls than slow walking speed²⁰. All of the subjects who were able to complete the TUG, required more time to do so than age and gender matched controls. This portrays the study population as having gait and balance limitations. Interpretation of this must be limited as the TUG was carried out after the subjects had presented to ED after a fall and had various injuries.

In conclusion, elderly fallers presenting to the ED were older, frail and socially vulnerable adults who are likely to require admission to hospital. The resource implications of this are significant at the moment and are likely to increase given the ageing population. Previous studies have documented a frailty prevalence of 6.9% in the community dwelling elderly⁸. The prevalence of frailty in the sample of elderly fallers in this study was very high (75%). These patients displayed risks of further falls with slow TUG speed or an inability to complete the TUG. Polypharmacy and decreased grip strength were also common. Slippers were the most frequent form of footwear worn at the time of falling. The prevalence of Osteoporosis in this group was low compared with international research, but the majority of subjects had never had a DEXA scan. A future study could include all fallers attending the ED to describe their demographic and frailty profile, and to determine their needs with regard to management and follow-up services.

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