ABSTRACT

Prediction and Prevention of Falls among Elderly People in Residential Care

Lillemor Lundin-Olsson, RPT, MSc, Physiotherapy and Geriatric Medicine, Department of Community Medicine and Rehabilitation, Umeå University, SE-901 87 Umeå, Sweden

Among elderly people, falls lead to a considerable amount of immobility, morbidity, and mortality. The purpose of this study was to develop and evaluate methods for predicting falls, and to evaluate a fall prevention program among elderly people living in residential care facilities. A fall was defined as any event in which the resident unintentionally came to rest on the floor or the ground regardless of whether or not an injury was sustained.

In developing the prediction methods, it was hypothesised that older persons showing difficulties in performing a familiar second task while walking were more likely to fall within six months. For residents who stopped walking when talking, the relative risk of falling was 3.5 (95% CI:2.0–6.2) compared to those who continued walking. For residents with a time difference (diffTUG) of at least 4.5 seconds between two performances of the Timed Up&Go test, with and without carrying a glass, the hazard ratio for falls was 4.7 (95% CI:1.5–14.2) compared to those with a shorter diffTUG.

A screening tool, the Mobility Interaction Fall (MIF) chart, was developed and evaluated, then validated in a new sample. This tool included a mobility rating, 'Stops walking when talking', 'diffTUG', a test of vision, and a concentration rating. In the first sample, the hazard ratio was 12.1 (95% CI:4.6–31.8) for residents classified as 'high-risk' compared to 'low-risk'. The positive predictive value was 78%, and the negative predictive value, the sensitivity, and the specificity were above 80% for falling in six months. In the second sample the prediction accuracy of the MIF chart was lower (hazard ratio 1.7, 95% CI:1.1–2.5) and a 6-month fall history or a global rating of fall risk by staff were at least equally valuable. A combination of any two of the methods – the MIF chart, staff judgement, fall history – was more accurate at identifying high risk residents than any method alone. Half of the residents classified by two methods as 'high risk' sustained a fall within 6 months.

In a randomised study a prevention program directed to residents, staff, and environment resulted in a significant reduction in the number of residents falling (44% vs. 56%; odds ratio 0.62, 95% CI:0.41–0.92), the incidence of falls (incidence rate ratio IRR 0.80, 95% CI:0.69–0.94) and of femoral fractures (IRR 0.25, 95% CI:0.08–0.82) in the intervention compared to the control group.

In conclusion, a combination of any two of the staff judgement, fall history or MIF chart has the potential to identify a large proportion of residents at particular high fall risk. A multidisciplinary and multifactorial fall prevention program directed to residents, staff, and the environment can reduce the number of residents falling, of falls and of femoral fractures.

Keywords: accidental falls, risk factors, movement, equilibrium, predictive value of test, accidental falls: prevention & control, randomised controlled trials, frail elderly, residential facilities.