

A multifactorial intervention after a fall did not prevent falls in elderly patients with cognitive impairment and dementia

Shaw FE, Bond J, Richardson DA, et al. Multifactorial intervention after a fall in older people with cognitive impairment and dementia presenting to the accident and emergency department: randomised controlled trial. *BMJ* 2003;326:73–8.

QUESTION: In elderly patients with cognitive impairment and dementia, is multifactorial assessment and intervention as effective as conventional care for preventing falls?

Design

Randomised (allocation concealed), blinded (data collectors)*, controlled trial with 1 year of follow up.

Setting

2 inner city accident and emergency (AE) departments in Newcastle upon Tyne, UK.

Patients

308 patients ≥65 years of age with cognitive impairment and dementia (Mini-Mental State Examination [MMSE] score <24), who presented to the AE department after a fall (defined as an event reported by the patient or witness of an unintentional coming to rest on the ground or at another lower level with or without loss of consciousness or injury). Exclusion criteria were inability to walk, a medical diagnosis that likely caused the index fall, unfit for investigation within 4 months, inability to communicate for reasons other than dementia, residence outside the recruitment area, or ≤2 contacts per week with a visitor. 89% of patients were included in the analysis (mean age 84 y, 80% women).

Intervention

Patients were stratified by MMSE score (20–23 [mild cognitive impairment], 12–19 [moderate], 4–11 [severe], and 0–3 [very severe]). 150 patients were allocated to a multi-

factorial assessment and intervention protocol, which comprised assessment, risk factor identification, and interventions, each in 4 areas of care (medical, cardiovascular, physiotherapy, and occupational therapy). 158 patients were allocated to conventional care from various healthcare professionals.

Main outcome measures

Number of patients who fell at least once in the year after the intervention. Secondary outcomes were number of falls, time to first fall, injury rates, fall related AE attendances, fall related hospital admissions, and mortality.

Main results

Analysis was by intention to treat. The intervention and conventional care groups did not differ for the number of patients who fell at least once (table), or for any of the secondary outcomes (median number of falls 3 v 3, median number of weeks to first fall 11 v 11). Other outcomes are reported in the table.

Conclusion

In elderly patients with cognitive impairment and dementia who presented to the accident and emergency department after a fall, a multifactorial assessment and intervention protocol did not prevent falls at 1 year.

Sources of funding: Alzheimer's Society and Northern and Yorkshire NHS Executive.

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Multifactorial intervention v conventional care for preventing falls in elderly, cognitively impaired patients after a fall*

Outcomes at 1 year	Multifactorial intervention	Conventional care	RRR (95% CI)	NNT
Proportion of patients who fell	74%	80%	8% (–5 to 19)	Not significant
			RRI (CI)	NNH
Major injury rate	28%	21%	32% (–13 to 100)	Not significant
Fall related AE department attendance	40%	32%	25% (–9 to 72)	Not significant
Fall related hospital admission	15%	13%	11% (–39 to 100)	Not significant
Mortality	21%	20%	3% (–35 to 64)	Not significant

*AE = accident and emergency; other abbreviations defined in glossary. RRR, RRI, and CI calculated from data in article.

COMMENTARY

The consequences of falls can be serious in elderly people who are often unable to regain pre-injury levels of physical function. Patients with hip fractures and other injuries can also experience a loss of confidence, which influences quality of life.^{1–2} Research on the prevention of falls and the minimisation of their consequences is therefore urgently needed.

The trial by Shaw *et al* assessed the effectiveness of a multifactorial intervention with blinded outcome assessment in older people with cognitive impairment and dementia presenting to an AE department after a fall. Unlike previous studies that have shown the effectiveness of multifactorial interventions for preventing falls,³ Shaw *et al* found no significant effect associated with the intervention. These findings suggest that even though multifactorial interventions may prevent falls in elderly people with no cognitive impairment, the same effect cannot be assumed for elderly patients with cognitive impairment. It is unclear why the intervention was not found to be effective, although the investigators postulate the causal pathways for falling may be different in people with dementia, thus requiring different emphases in a multifactorial approach. Additionally, the study was powered to detect a 30% reduction in falls over 1 year, which was not the more modest difference that was observed. However, cognitively impaired elderly people are at considerable risk of falling, and research is needed to determine suitable interventions that either prevent falls or reduce injuries related to falls.

By preventing falls, it is assumed that injury rates and use of healthcare services will be reduced. An alternative strategy evaluated by Meyer *et al* in a cluster randomised trial, examined fracture prevention rather than fall prevention. The study design represents an improvement over previous trials of hip protectors, which have been underpowered or used inappropriate statistical methods in their analysis.⁴ The authors concluded that the educational intervention was effective for increasing use of hip protectors and that fewer hip fractures occurred (although the reduction was not significant).

The study by Meyer *et al* is an important advance, although 3 factors need consideration. Firstly, the control group fell more frequently during the trial period despite the similarity in the number of fallers. This differential suggests the possibility of a cointervention in the treatment arm, which may have resulted from an interaction between patients' own vigilance and education about hip protectors. Secondly, the cognitive function of the study participants was not described, and therefore baseline equivalence could not be examined for this prognostic factor. Thirdly, the control group had a slightly shorter follow up (13.7 v 14.7 mo), which may have led to an underestimation of the effectiveness of hip protectors. In addition, the cost analysis from this study has yet to be reported, and such information will be useful for health policy analysts.

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A structured education programme increased hip protector use and may reduce hip fractures in nursing homes

Meyer G, Wårnke A, Bender R, et al. *Effect on hip fractures of increased use of hip protectors in nursing homes: cluster randomised controlled trial. BMJ 2003;326:76–80.*

QUESTION: In elderly nursing home residents, does a structured education programme designed to increase use of hip protectors reduce the number of hip fractures more than usual care?

Design

Cluster randomised (allocation concealed), unblinded, controlled trial with 18 months of follow up.

were allocated to usual care, in which a designated coordinator received brief information and a demonstration about hip protectors.

Setting

42 nursing homes in Hamburg, Germany.

Main outcome measures

Main outcome was hip fracture. Secondary outcomes included hip protector use (proportion of falls with documented hip protector use and proportion of fallers with documented hip protector use during ≥ 1 fall).

Patients

942 nursing home residents (in 49 nursing home clusters) who were ≥ 70 years of age (mean age 87 y, 86% women), not bedridden, and living in the nursing home for >3 months. All patients and clusters were included in the analysis.

Main results

Analysis was by intention to treat. Residents in the intervention group had fewer hip fractures than those in the usual care group (21 v 42). However, the groups did not significantly differ for number of residents with hip fractures (4.6% v 8.1%; $p=0.07$). The groups did not differ for residents with ≥ 1 fall (50% v 56%, $p=0.32$). Of those who fell ($n=511$), more residents in the intervention group than in the usual care group used hip protectors (68% v 15%, $p<0.001$, adjusted for cluster randomisation). Hip protectors were used during a greater proportion of falls among residents in the intervention group (54% v 8%, $p<0.001$).

Intervention

25 nursing home clusters ($n=459$) were allocated to a structured education programme designed to increase hip protector use. Staff from each cluster attended a 60–90 minute educational session (mean 12 staff/cluster) on the risk of hip fracture and related morbidity, strategies to prevent falls and fractures, effectiveness of hip protectors, aspects known to interfere with hip protector use, and strategies for successful implementation. At least 1 nurse/cluster then delivered the educational programme to nursing home residents individually or in small groups. Free hip protectors were provided (3 protectors/resident). 24 nursing home clusters ($n=483$)

Conclusion

In elderly nursing home residents, a structured education programme increased hip protector use and may reduce hip fractures.

Sources of funding: Public Health Research Network Northern Germany and Rölke Pharma provided the hip protectors.

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Meyer *et al* contributes to the available evidence that hip protectors are effective in residential communities, although low adherence compromises their potential for effectiveness. About one third of the fallers in the intervention group did not wear hip protectors. Although this was much better than the compliance rate in the control group, it indicates just how difficult implementation of successful injury prevention interventions can be. Ideally, hip protectors should be worn by larger proportion of those who are at risk. If nurses feel that hip protectors would be useful as part of a broader falls prevention strategy, then it would be advisable to assess the likelihood of compliance on an individual basis. Older people who express reservations or have practical problems that make hip protector use difficult are unlikely to persevere with them.

Management of falls in the elderly remains a huge challenge. Multifactorial interventions are effective for some people but remain a "black box" in others. Clarifying which intervention or combination of interventions is most effective may lead to more effective prevention models for elderly people with or without cognitive impairment.

Finally, the results of Shaw *et al* remind us that we cannot assume that an intervention that is effective in one population (elderly people with no cognitive impairment) will be effective in another (elderly people with cognitive impairment). Similarly, although the findings of Meyer *et al* suggest that hip protectors are effective in residential settings, we should be cautious about assuming that they are effective in community dwelling older people.

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