Multifactorial assessment and targeted intervention for preventing falls and injuries among older people in community and emergency care settings: systematic review and meta-analysis


CRD summary
The authors concluded that there is currently limited evidence to support the effectiveness of multifactorial fall prevention programmes in community, primary or emergency care settings. The review was generally well conducted. However, the authors’ conclusions, though cautious, may be overstating the case for fall prevention programmes in view of the lack of statistically significant evidence in their favour.

Authors’ objectives
To evaluate the effectiveness of multifactorial assessment and targeted intervention for prevention of falls and injuries among older people in primary care, community and emergency care settings.

Searching
MEDLINE, EMBASE, CINAHL, PsycINFO, the Cochrane CENTRAL Register and the Social Sciences Citation Index were searched to March 2007. References to the search strategies were supplied. The reference lists of articles retrieved in the search and of a relevant Cochrane review (Gillespie 2003) were checked. There was no language restriction, but studies published only as abstracts were excluded.

Study selection
Randomised and quasi-randomised controlled trials of interventions to prevent falls or fall-related injuries were eligible for inclusion, provided they included a multifactorial risk assessment followed by an intervention for preventing falls. It was required that the intervention was delivered or arranged by a health professional, and that it targeted individuals rather than a community or population. Required outcomes were number of fallers, recurrent fallers, fall rate or fall-related injuries. Required setting was the community, primary care or emergency care. The control group condition could be routine care or no fall prevention intervention.

The review included studies of older adults (mean age 72 to 85 years), in some cases selected as being at high risk of falls. Risk assessments (where described) commonly included evaluation of gait and balance, and of the home environment, and review of medications. Interventions varied in intensity and included exercise, medications, surgery and/or information and referral to other health professionals. Control conditions included usual care, no intervention, multifactorial assessment without subsequent treatment and alternative interventions. A range of outcomes relating to falls were reported; methods of ascertaining and defining outcomes varied widely. The duration of follow up ranged from two months to three years.

Studies were selected by two reviewers independently. Disagreements were resolved by discussion with a third reviewer.

Assessment of study quality
The following criteria were used to assess validity: allocation concealment, losses and exclusions, proportion of participants analysed, blinding, baseline comparability of groups, co-interventions, clarity of inclusion/exclusion criteria, reliability of outcomes ascertainment, duration of follow up and statistical methods used for cluster randomised trials. Two reviewers independently extracted data on quality. Disagreements were resolved by discussion with a third reviewer.

Data extraction
Data were extracted using an internationally agreed tool for classifying fall prevention data. Risk ratios (RR) were calculated from the numbers of events in each control and intervention group, with 95% confidence intervals (CI). Data were reported at 12 month follow up when available, or (for shorter studies) at the longest follow-up time possible. Intention to treat analysis was used in the review, where calculable. Data were extracted by two reviewers working
Methods of synthesis
RRs were pooled in a random-effects model. Heterogeneity was assessed using the $I^2$ statistic and was explored with interaction tests, subgrouping the studies by setting, participant risk level, doctor involvement and intervention intensity. Data from cluster randomised trials were statistically adjusted to allow for clustering before being pooled with individually randomised trials. Estimates of the intraclass correlation coefficient were taken from the study or estimated at 0.01 and sensitivity analyses were conducted to investigate this choice of estimate.

Results of the review
Nineteen randomised controlled trials (RCTs) were included in the review (n=6,397), including one quasi-randomised and two cluster randomised (n=470)

Quality
Most RCTs were small and of limited quality. Among individually randomised RCTs (n=17) the mean quality score was 23.8 out of a maximum of 36, five reported secure allocation concealment, six reported blinding or partial blinding of assessment and one reported partial blinding of care providers, five had over 20% of participants lost to follow up or excluded from analysis, and several failed to analyse by intention to treat. Only one of the two cluster randomised trials took clustering into account in analysis.

Falls
No significant difference was found between the groups during follow up for any outcome. Outcomes reported were: number of fallers (RR 0.91, 95% CI: 0.82, 1.02, I² 59.8%, 18 RCTs), fall-related injuries (RR 0.90, 95% CI: 0.68, 1.20, I² 55.6%, 8 RCTs), recurrent falls, admission to hospital, attendance at emergency department, death and move to institutional care. There were very few per person-year data on rates of falls and none on injuries. One RCT found a significantly higher rate of attendance at the doctor's surgery in the intervention group (RR 1.39, 95% CI: 1.11 to 1.74).

Subgroup and sensitivity analyses
A larger reduction in the number of fallers was found in RCTs with higher intensity interventions compared to RCTs of interventions providing only knowledge and referral (p=0.05). Results of other subgroup and sensitivity analyses did not approach statistical significance.

Authors' conclusions
There is currently limited evidence to support the effectiveness of multifactorial fall prevention programmes in community, primary or emergency care settings.

CRD commentary
Relevant sources were searched without language restriction. However, the authors excluded studies published only as abstracts and it does not appear that publication bias was assessed. Steps were taken to minimise bias or error by having more than one reviewer make independent decisions on study selection, validity and data extraction. The decision to pool the studies appears appropriate. Suitable statistical methods were used for meta-analysis and for assessment and investigation of heterogeneity. Relevant criteria were used for validity assessment. Potential sources of bias and heterogeneity were well addressed in the text. The review was generally well conducted. However, the authors' conclusions, though cautious, may be overstating the case for fall prevention programmes in view of the lack of statistically significant evidence in their favour.

Implications of the review for practice and research
Practice: the authors state that higher intensity interventions addressing risk factors for falls may be more effective than information-giving and referral.

Research: the authors state that well-powered RCTs are needed to clarify whether interventions in this area are effective and cost-effective. The outcomes should be fall-related injuries (for example, peripheral fractures), number of fallers, rates of falls and health-related quality of life.
Funding
The National Institute of Health Research delivery and organisation programme project No SDO/139/2006.

Bibliographic details

PubMedID
18089892

DOI
10.1136/bmj.39412.525243.BE

Original Paper URL
http://www.bmj.com/content/336/7636/130

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Accidental Falls /prevention & control /statistics & numerical data; Aged; Community Health Services /methods; Emergencies; Emergency Medical Services /methods; Female; Humans; Male; Prognosis; Randomized Controlled Trials as Topic; Risk Assessment /methods; Risk Factors; Wounds and Injuries /prevention & control

AccessionNumber
12008008028

Date bibliographic record published
14/03/2008

Date abstract record published
03/02/2009

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.