Interventions for preventing falls in older people living in the community (Review)

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[Intervention Review]

Interventions for preventing falls in older people living in the community

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ABSTRACT

Background

Approximately 30% of people over 65 years of age living in the community fall each year. This is an update of a Cochrane review first published in 2009.

Objectives

To assess the effects of interventions designed to reduce the incidence of falls in older people living in the community.

Search methods

We searched the Cochrane Bone, Joint and Muscle Trauma Group Specialised Register (February 2012), CENTRAL (*The Cochrane Library* 2012, Issue 3), MEDLINE (1946 to March 2012), EMBASE (1947 to March 2012), CINAHL (1982 to February 2012), and online trial registers.

Selection criteria

Randomised trials of interventions to reduce falls in community-dwelling older people.

Data collection and analysis

Two review authors independently assessed risk of bias and extracted data. We used a rate ratio (RaR) and 95% confidence interval (CI) to compare the rate of falls (e.g. falls per person year) between intervention and control groups. For risk of falling, we used a risk ratio (RR) and 95% CI based on the number of people falling (fallers) in each group. We pooled data where appropriate.

Main results

We included 159 trials with 79,193 participants. Most trials compared a fall prevention intervention with no intervention or an intervention not expected to reduce falls. The most common interventions tested were exercise as a single intervention (59 trials) and multifactorial programmes (40 trials). Sixty-two per cent (99/159) of trials were at low risk of bias for sequence generation, 60% for attrition bias for falls (66/110), 73% for attrition bias for fallers (96/131), and only 38% (60/159) for allocation concealment.

Multiple-component group exercise significantly reduced rate of falls (RaR 0.71, 95% CI 0.63 to 0.82; 16 trials; 3622 participants) and risk of falling (RR 0.85, 95% CI 0.76 to 0.96; 22 trials; 5333 participants), as did multiple-component home-based exercise (RaR 0.68, 95% CI 0.58 to 0.80; seven trials; 951 participants and RR 0.78, 95% CI 0.64 to 0.94; six trials; 714 participants). For Tai Chi, the reduction in rate of falls bordered on statistical significance (RaR 0.72, 95% CI 0.52 to 1.00; five trials; 1563 participants) but Tai Chi did significantly reduce risk of falling (RR 0.71, 95% CI 0.57 to 0.87; six trials; 1625 participants).

Multifactorial interventions, which include individual risk assessment, reduced rate of falls (RaR 0.76, 95% CI 0.67 to 0.86; 19 trials; 9503 participants), but not risk of falling (RR 0.93, 95% CI 0.86 to 1.02; 34 trials; 13,617 participants).

Overall, vitamin D did not reduce rate of falls (RaR 1.00, 95% CI 0.90 to 1.11; seven trials; 9324 participants) or risk of falling (RR 0.96, 95% CI 0.89 to 1.03; 13 trials; 26,747 participants), but may do so in people with lower vitamin D levels before treatment.

Home safety assessment and modification interventions were effective in reducing rate of falls (RR 0.81, 95% CI 0.68 to 0.97; six trials; 4208 participants) and risk of falling (RR 0.88, 95% CI 0.80 to 0.96; seven trials; 4051 participants). These interventions were more effective in people at higher risk of falling, including those with severe visual impairment. Home safety interventions appear to be more effective when delivered by an occupational therapist.

An intervention to treat vision problems (616 participants) resulted in a significant *increase* in the rate of falls (RaR 1.57, 95% CI 1.19 to 2.06) and risk of falling (RR 1.54, 95% CI 1.24 to 1.91). When regular wearers of multifocal glasses (597 participants) were given single lens glasses, all falls and outside falls were significantly reduced in the subgroup that regularly took part in outside activities. Conversely, there was a significant *increase* in outside falls in intervention group participants who took part in little outside activity.

Pacemakers reduced rate of falls in people with carotid sinus hypersensitivity (RaR 0.73, 95% CI 0.57 to 0.93; three trials; 349 participants) but not risk of falling. First eye cataract surgery in women reduced rate of falls (RaR 0.66, 95% CI 0.45 to 0.95; one trial; 306 participants), but second eye cataract surgery did not.

Gradual withdrawal of psychotropic medication reduced rate of falls (RaR 0.34, 95% CI 0.16 to 0.73; one trial; 93 participants), but not risk of falling. A prescribing modification programme for primary care physicians significantly reduced risk of falling (RR 0.61, 95% CI 0.41 to 0.91; one trial; 659 participants).

An anti-slip shoe device reduced rate of falls in icy conditions (RaR 0.42, 95% CI 0.22 to 0.78; one trial; 109 participants). One trial (305 participants) comparing multifaceted podiatry including foot and ankle exercises with standard podiatry in people with disabling foot pain significantly reduced the rate of falls (RaR 0.64, 95% CI 0.45 to 0.91) but not the risk of falling.

There is no evidence of effect for cognitive behavioural interventions on rate of falls (RaR 1.00, 95% CI 0.37 to 2.72; one trial; 120 participants) or risk of falling (RR 1.11, 95% CI 0.80 to 1.54; two trials; 350 participants).

Trials testing interventions to increase knowledge/educate about fall prevention alone did not significantly reduce the rate of falls (RaR 0.33, 95% CI 0.09 to 1.20; one trial; 45 participants) or risk of falling (RR 0.88, 95% CI 0.75 to 1.03; four trials; 2555 participants).

No conclusions can be drawn from the 47 trials reporting fall-related fractures.

Thirteen trials provided a comprehensive economic evaluation. Three of these indicated cost savings for their interventions during the trial period: home-based exercise in over 80-year-olds, home safety assessment and modification in those with a previous fall, and one multifactorial programme targeting eight specific risk factors.

Authors' conclusions

Group and home-based exercise programmes, and home safety interventions reduce rate of falls and risk of falling.

Multifactorial assessment and intervention programmes reduce rate of falls but not risk of falling; Tai Chi reduces risk of falling.

Overall, vitamin D supplementation does not appear to reduce falls but may be effective in people who have lower vitamin D levels before treatment.

PLAIN LANGUAGE SUMMARY

Interventions for preventing falls in older people living in the community

As people get older, they may fall more often for a variety of reasons including problems with balance, poor vision, and dementia. Up to 30% may fall in a year. Although one in five falls may require medical attention, less than one in 10 results in a fracture.

This review looked at the healthcare literature to establish which fall prevention interventions are effective for older people living in the community, and included 159 randomised controlled trials with 79,193 participants.

Group and home-based exercise programmes, usually containing some balance and strength training exercises, effectively reduced falls, as did Tai Chi.

Multifactorial interventions assess an individual's risk of falling, and then carry out treatment or arrange referrals to reduce the identified risks. Overall, current evidence shows that this type of intervention reduces the number of falls in older people living in the community but not the number of people falling during follow-up. These are complex interventions, and their effectiveness may be dependent on factors yet to be determined.

Interventions to improve home safety appear to be effective, especially in people at higher risk of falling and when carried out by occupational therapists. An anti-slip shoe device worn in icy conditions can also reduce falls.

Taking vitamin D supplements does not appear to reduce falls in most community-dwelling older people, but may do so in those who have lower vitamin D levels in the blood before treatment.

Some medications increase the risk of falling. Three trials in this review failed to reduce the number of falls by reviewing and adjusting medications. A fourth trial involving family physicians and their patients in medication review was effective in reducing falls. Gradual withdrawal of a particular type of drug for improving sleep, reducing anxiety, and treating depression (psychotropic medication) has been shown to reduce falls.

Cataract surgery reduces falls in women having the operation on the first affected eye. Insertion of a pacemaker can reduce falls in people with frequent falls associated with carotid sinus hypersensitivity, a condition which causes sudden changes in heart rate and blood pressure.

In people with disabling foot pain, the addition of footwear assessment, customised insoles, and foot and ankle exercises to regular podiatry reduced the number of falls but not the number of people falling.

The evidence relating to the provision of educational materials alone for preventing falls is inconclusive.