

Review: Intrinsic and environmental risk-factor modification reduces falls in elderly persons

Gillespie LD, Gillespie WJ, Robertson MC, et al. **Interventions for preventing falls in elderly people.** Cochrane Database Syst Rev. 2001;(3):CD000340 (latest version 19 May 2001).

QUESTION

In community-dwelling and institutionalized elderly persons, how effective are programs designed to reduce the incidence of falls?

DATA SOURCES

Studies were identified by searching 8 databases. Bibliographies of relevant studies were reviewed, and researchers in the field were contacted for unpublished trials.

STUDY SELECTION

Studies in any language were selected if they were randomized controlled trials (RCTs) designed to minimize the effect of or exposure to any risk factor for falling; if they compared an intervention or group of interventions with usual care or alternative care; and if participants were elderly persons living in the community or in institutional care.

DATA EXTRACTION

Data were extracted on setting, patient inclusion and exclusion criteria, sample size, key components of the intervention, study quality, and outcomes. Outcomes were the number of persons who fell, the number of falls, and the severity of falls.

MAIN RESULTS

40 studies met the selection criteria. 14 RCTs evaluated exercise or physical-therapy interventions: Participants in an individually tailored program of progressive muscle strengthening, balance-retaining exercises,

and a walking plan (3 RCTs) had lower rates of falls and injurious falls than did control-group participants at 1 year (Table). Participants exposed to a 15-week tai chi untargeted group intervention (1 RCT) had a lower rate of falling than did control-group participants (risk ratio [RR] 0.51, 95% CI 0.36 to 0.73). 1 RCT evaluated a home-safety intervention by an occupational therapist: Among patients with a history of ≥ 1 fall in the previous year, the rate of falls was lower in the intervention group than in the control group (RR 0.64, CI 0.49 to 0.84). 1 RCT evaluated a placebo-controlled medication withdrawal program: The overall risk for falls was lower for the psychotropic medication withdrawal group (relative hazard 0.34, CI 0.16 to 0.74). Multidisciplinary, multifactorial, health, or environmental risk-factor screening or intervention programs, both for unselected community-dwelling older persons and for older

persons selected because of known risk factors, were evaluated in 7 and 2 RCTs, respectively: For both unselected (3 RCTs) and selected persons (2 RCTs), the intervention groups had lower rates of falls than did control groups (Table).

CONCLUSIONS

In community-dwelling elderly persons, intervention programs that target both intrinsic and environmental risk factors may reduce the incidence of falls. However, evidence of effectiveness in institutional settings is lacking.

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Interventions for preventing falls in unselected community-dwelling elderly persons (U) or in community-dwelling elderly persons with a history of falls or fall risk factors (R)*

Outcomes at ≥ 44 wk	Group	Comparison	Weighted event rates	RRR (95% CI)	NNT (CI)
NPF	R	MSB vs control	36% vs 45%	20% (2 to 36)	12 (6 to 100)
	U	AFMI vs control	24% vs 33%	27% (14 to 37)	12 (8 to 23)
	R	AFMI vs control	45% vs 57%	21% (6 to 33)	9 (6 to 28)
NSIF	R	MSB vs Control	22% vs 33%	33% (11 to 49)	10 (6 to 32)

*AFMI = assessment followed by multifactorial intervention; MSB = muscle strengthening and balance retaining; NPF = number of persons falling; NSIF = number sustaining a fall with injury. Other abbreviations defined in Glossary; RRR, NNT, and CI calculated from data in article using a fixed-effects model.

COMMENTARY

The review by Gillespie and colleagues clearly shows that several interventions are effective in reducing falls in older persons generally and in those with an established risk for falls. Most research has been done in the community setting where evidence is strongest. The challenge of preventing falls in hospital and residential elderly-care settings differs from that in community settings and may limit the generalizability of these results. Comprehensive assessment and targeted management programs seem to be the best approach across settings. However, consensus does not exist about the type of risk-factor assessment that should be done (1). Multidisciplinary falls clinics, which use a comprehensive assessment and management program for persons at high risk for falling (2), have not been evaluated in RCTs.

Exercise is the most extensively investigated single intervention. Common to most of the exercise programs that have shown reduced falls is a balance component (3) (e.g., tai chi [4] and individualized home exercise programs [5]). Strength training has also formed part of successful fall-prevention programs.

Further research should focus on hospital and residential elderly-care settings and on persons at high risk for falls (e.g., patients with dementia, stroke, and Parkinson disease). Additionally, studies investigating strategies for increased adherence to effective interventions are also required.

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