The effects of exercise on falls in elderly patients: a preplanned meta-analysis of the FICSIT Trials


Authors' objectives
To determine if short-term exercise reduces falls and fall-related injuries in the elderly. This was to be performed by a pre-planned meta-analysis of the seven Frailty and Injuries: Cooperative Studies of Intervention Techniques (FICSIT) trials.

Searching
The studies were all part of a collection of eight independent clinical trials, which made up a multicentre study in the USA called Frailty and Injuries: Cooperative Studies of Intervention Techniques (FICSIT).

Study selection

Study designs of evaluations included in the review
All the studies were randomised controlled trials.

Specific interventions included in the review
All the studies to be included were of exercise programmes. All programmes were community- or nursing home-based and lasted 10 to 36 weeks. The interventions included at least one (and usually two or more) of the following components: endurance, flexibility, resistance, balance, educational/behavioural, medication changes, and nutritional supplements.

Participants included in the review
All studies included elderly patients only. Most studies included ambulatory participants; one included only those with balance deficits and low thigh strength, while another included only those who were functionally dependent in two or more activities of daily living. The lower age limit for inclusion in any of the studies was 70 years, although two studies enrolled patients aged 65 and over as long as they had fallen or had a recognised mobility deficit.

Outcomes assessed in the review
Each study assessed falls and injurious falls from randomisation to the end of the intervention programme, and then through a follow-up period of 2 to 4 years. The definition of falls and the taxonomy of injuries was common across all of the included studies. The other outcomes were functional status, muscle strength, balance and activities of daily living.

How were decisions on the relevance of primary studies made?
It was pre-planned that all randomised controlled trials of the FICSIT study were to be included.

Assessment of study quality
The review does not provide details of how the individual patient data (IPD) from the individual studies were checked. However, it does state that all randomisation procedures succeeded in producing comparable treatment groups. The review does not state whether or not the IPD were checked.

Data extraction
The results included in the review were generated using the December 20, 1994 version of the FICSIT Common Database.
Methods of synthesis
How were the studies combined?
The studies were pooled in a meta-analysis of IPD. A multivariate model was applied to each set of study data separately in order to generate summary statistics for each individual study. The Andersen-Gill extension of the Cox proportional hazards model was used (see Other Publications of Related Interest no.1). To ensure that patients experiencing multiple falls did not unduly influence the results, the findings were confirmed using a more traditional Cox model on time to first fall. The summary estimates were then pooled to generate a pooled estimate of effect using the methods of DerSimonian and Laird (see Other Publications of Related Interest no.2) and Fleiss and Gross (see Other Publications of Related Interest no.3).

How were differences between studies investigated?
Heterogeneity between the studies was formally investigated. The studies were only pooled if this was not statistically significant.

Results of the review
Seven trials (N=2,277) were included.

There was no statistically-significant heterogeneity between the studies. The adjusted fall incidence ratio was 0.90 (95% confidence interval, CI: 0.81, 0.99) for treatment arms including general exercise, and 0.83 (95% CI: 0.70, 0.98) for those including balance. When treatment arms with non-exercise components were excluded from the analysis, the effect of exercise was no longer statistically significant (p=0.12), but the effect of balance training remained so (p=0.01). No exercise component with or without non-exercise components had a statistically-significant effect on injurious falls.

Authors’ conclusions
The authors concluded ‘treatments including exercise for elderly adults reduce the risks of falls’. They went on to state that ‘The FICSIT interventions that included balance training had a significant effect on falls’ but that ‘The limited number of interventions and populations tested in FICSIT do not permit a definitive factorial analysis to examine the effects of each type of exercise in itself’.

CRD commentary
This meta-analysis addressed an appropriate clinically relevant question. The included studies comprised a pre-planned set of studies rather than all the possible randomised controlled studies that might have been included in this review. Although the authors described their analysis as a meta-analysis of IPD, no details of the handling and checking of IPD were reported except for one statement regarding randomisation: ‘All randomisation procedures succeeded in producing comparable treatment groups’. The details of the individual studies were presented adequately. The authors’ conclusion, that treatments including exercise for the elderly reduce the risks of falls, is supported by the review. However, it must be borne in mind that the size of this beneficial effect was small and that the important components of any exercise-containing intervention have yet to be determined.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors state ‘the question of the efficacy of exercise on injurious falls ... will have to await a much larger clinical trial specifically designed for that purpose’.

Bibliographic details
Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Accidental Falls /prevention & control /statistics & numerical data; Activities of Daily Living; Aged; Aged, 80 and over; Exercise; Frail Elderly /statistics & numerical data; Geriatric Assessment; Humans; Incidence; Multivariate Analysis; Proportional Hazards Models; Randomized Controlled Trials as Topic

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