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[Intervention Review]

Exercise for improving balance in older people

Tracey E Howe[1], Lynn Rochester[2], Alison Jackson[3], Pauline MH Banks[4], Valerie A Blair[5]

[1]HealthQWest, Glasgow Caledonian University, Glasgow, UK. [2]School of Health, Community and Education Studies, Northumbria University, Newcastle upon Tyne, UK. [3]Department of Psychological Medicine, University of Glasgow, Glasgow, UK. [4]School of Health Studies, HealthQWest, Hamilton, UK. [5]School of Health Studies, Bell College, Hamilton, UK

Contact address: Tracey E Howe, HealthQWest, Glasgow Caledonian University, Cowcaddens Road, Glasgow, Scotland, G4 0BA, UK. tracey.howe@gcal.ac.uk.

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ABSTRACT

Background

Diminished ability to maintain balance may be associated with an increased risk of falling. In older adults, falls commonly lead to injury, loss of independence, associated illness and early death. Although some exercise interventions with balance and muscle strengthening components have been shown to reduce falls it is not known which elements, or combination of elements, of exercise interventions are most effective for improving balance in older people.

Objectives

To present the best evidence for effectiveness of exercise interventions designed to improve balance in older people living in the community or in institutional care.

Search methods

We searched the Cochrane Bone, Joint and Muscle Trauma Group Specialised Register (Feb 2006), the Cochrane Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library* 2006, Issue 1), MEDLINE (1966 to February 2006), EMBASE (1980 to February 2006), other databases and reference lists of articles. No language restrictions were applied.

Selection criteria

Randomised controlled trials and quasi-randomised trials testing exercise interventions designed to improve balance in older people were included. We excluded trials of interventions targeting individuals with specific conditions in order not to broaden the scope of this review too widely. Trials were included where participants were randomised to receive the following: a single exercise intervention or a multiple exercise intervention and a control group (usual activities or attention or recreational activity). Trials comparing two or more exercise interventions and a control group were also included.

Data collection and analysis

Three pairs of members of the review team independently assessed trial quality and extracted data. For each trial, relative risk and 95% confidence intervals were calculated for dichotomous outcomes, and mean differences and 95% confidence intervals calculated for continuous outcomes. Where appropriate, results of comparable groups of trials were pooled and 95% confidence intervals calculated.

Main results

For the 34 included studies there were 2883 participants at entry. Statistically significant improvements in balance ability were observed for exercise interventions compared to usual activity. Interventions involving gait; balance; co-ordination and functional exercises; muscle

strengthening; and multiple exercise types appear to have the greatest impact on indirect measures of balance. There was trend towards an improvement in balance with cycling on a static cycle. However, there was limited evidence that effects were long-lasting.

Authors' conclusions

Exercise appears to have statistically significant beneficial effects on balance ability in the short term but the strength of evidence contained within these trials is limited. Many of these mainly small studies demonstrated a range of methodological weaknesses. The failure across the included studies to apply a core set of standardised outcome measures to determine balance ability restricts the capacity to compare or pool different trials from which firm conclusions regarding efficacy can be made. Further standardisation in timing of outcome assessment is also required as is longer term follow-up of outcomes to determine any lasting effects.

PLAIN LANGUAGE SUMMARY

Exercise for improving balance in older people

A decrease in ability to maintain balance may be associated with an increased risk of falling. In older adults, falls often lead to injury, loss of independence, associated illness and early death. The objective of this review is to present the best evidence for the effectiveness of exercise interventions designed to improve balance in older people living in the community or in institutional care.

The review included 34 studies, with a total of 2883 participants, the majority of whom were women and on average over 75 years old. The review found that exercise has statistically significant positive effects on balance as opposed to usual activity for older people. This review investigated a variety of interventions. Those that appeared to have the greatest impact were walking; balance; co-ordination and functional exercises; muscle strengthening; and multiple exercise types. Improvements were seen in the ability to stand on one leg, reach forward without overbalancing and walking. There was trend towards an improvement in balance with cycling on a static cycle. In general, this review agrees with other systematic reviews covering related areas in older people, such as resistance training for physical disability and falls prevention.

Quality of evidence on the effectiveness of interventions was mixed, with many studies demonstrating a range of methodological weaknesses. In particular, there was a lack of a core set of standardised measures to determine balance ability across the 34 studies, which limits the interpretation of results. Thus, it was difficult to compare studies or to group the results of different studies. There was also a lack of follow up of participants that makes it hard to determine any long term effects of interventions.

Future studies should be well designed and provide detailed and accurate reporting. Ideally, trials should follow up participants one year after taking part to record long term effects, rather than just focusing on results immediately after the intervention.