The aim of this commentary is to discuss from a rehabilitation perspective the published Cochrane Review “Exercise for preventing falls in older people living in the community” by Sherrington et al. This review was produced with the support of the Cochrane Bone, Joint and Muscle Trauma Group. This Cochrane Corner is produced in agreement with the Journal of Musculoskeletal and Neuronal Interactions by Cochrane Rehabilitation.

Background

Falls are one of the most important health problems for older people living in the community, with significant consequences including reduced life expectancy. The total cost of fall-related injuries accounts for substantial economic resources of medical care, leading health systems to develop better policies for the prevention of falls. A growing body of evidence has shown that exercise can be effective in reducing the risk of falling and the fear of falling through the improvement of strength and balance. Other different types of interventions, including multifactorial interventions (home safety, educational counselling, correction of vitamin D deficiency), and physical activity programmes have also been demonstrated to be effective in the prevention of falls among older persons living in the community. However, there is a distinction between physical activity, defined as any bodily movement that results in increased energy expenditure and can be achieved by a variety of leisure-time, work or transportation-related activities, and exercise, referred to physical activities that are planned, structured, repetitive, and intended to improve or maintain fitness, function, and health. A recent Cochrane Review searched for evidence of the effectiveness of exercise interventions in the prevention of falls in community dwelling elderly.

Exercise for preventing falls in older people living in the community

(Sherrington C, Fairhall NJ, Wallbank GK, Tiedemann A, Michaleff ZA, Howard K, Clemson L, Hopewell S, Lamb SE. 2019)
What is the aim of this Cochrane review?

The aim of this Cochrane Review was to evaluate benefits and harms of exercise interventions for preventing falls in older people living in the community.

What was studied in the Cochrane review?

The population studied in the Cochrane Review was older people (an inclusion criterion of 60 years of age or over was specified) living in the community or in residences that did not provide residential health-related care or rehabilitative services. People with specific clinical conditions that increase the risk of falls, such as neurological diseases (e.g. stroke), hip fracture, and severe visual impairment were excluded by the review.

The studied interventions included a wide range of exercise programmes, categorized according to an established taxonomy of fall prevention interventions: gait, balance, and functional training; strength/resistance exercise; flexibility programmes; three-dimensional exercise (e.g. Tai Chi, Qigong, dance); general physical activity; endurance exercise; and other kinds of exercises. These exercise programmes were compared primarily with either ‘usual care’, defined as no change in usual activities, or a ‘control intervention’, defined as an intervention that is not thought to reduce falls, such as general health education, social visits, gentle exercise, or ‘sham’ exercise, not expected to impact on falls. The review also undertook secondary comparisons of different exercise programmes; these are not covered in this summary.

The primary outcome of this review was the rate of falls (number of falls per person-year). The secondary outcomes of this review were: the risk of falling (number of people experiencing one or more falls), the presence of fall-related fractures, the need for medical attention or hospital admission due to falls, health-related quality of life (HRQoL), and adverse effects. In addition, data on mortality and the possible socio-economic impact were studied.

Search methodology and up-to-dateness of the Cochrane review?

The review authors searched for studies that had been published up to 2 May 2018.

What are the main results of the Cochrane review?

The review included 108 randomized controlled trials (RCTs), involving 23,407 participants with a mean age of 76 years, mostly (77%) women. Eighty-one of these trials involving 19,684 participants compared exercise (all types) with control intervention (defined as the one not thought to reduce falls).

The review shows:

When all types of exercise interventions are compared to the control group:

- A reduction in the rate of falls by 23% (59 trials with 12,981 participants) (high-certainty evidence).
- A reduction in the number of individuals sustaining one or more falls by 15% (63 trials with 13,518 participants) (high-certainty evidence).
- A possible reduction in the number of individuals sustaining one or more falls-related fractures (10 trials, 4,047 participants) (low-certainty evidence).
- A possible reduction in the number of individuals who fell once or more which required medical attention (5 studies with 1,019 participants) (low-certainty evidence).
- Uncertainty whether exercise is effective in reducing the number of individuals who fell once or more which required hospital admission (2 trials with 1,705 participants) (very low-certainty evidence).
- A possible effect of exercise making little important difference to HRQoL (15 trials with 3,172 participants) (low-certainty evidence).
- The evidence for adverse events associated with exercise was very limited. Where reported, they were usually non-serious adverse events of a musculoskeletal nature.

Preplanned subgroup analyses showed no evidence of a difference with regard to effect on both falls outcomes according to the selection of participants at increased risk of falling or not in trials. However, subgroup analysis showed that different forms of exercise had different impacts on falls. The review reported the results for the different types of exercise programmes versus control for a reduced set of outcomes. There were no trials comparing flexibility or endurance exercise versus control.

Balance and functional exercises:

- A reduction by 24% in the rate of falls (39 trials with 7,920 participants) (high-certainty evidence) and by 13% in the number of elderly who sustained falls once or more (37 trials with 8,288 participants) (high-certainty evidence).
- A possible reduction by 56% in the number of elderly who sustained one or more falls-related fractures (7 trials with 2,139 participants) (low-certainty evidence).
- Mostly nonserious and musculoskeletal adverse events; some other adverse events including shortness of breath, palpitations (in 4 and 1 participants, respectively) and a pelvic stress fracture in a single study (15 trials with 4,167 participants) (very low-certainty evidence).

Multiple exercise categories (gait, balance, and functional training plus resistance training):

- A probable reduction by 34% in the rate of falls (11 trials with 1,374 participants) (moderate-certainty evidence) and by 22% in the number of those sustaining one or more falls (17 trials with 1,623 participants) (moderate-certainty evidence).
- A possible reduction in the number of individuals with one or more falls-related fractures by 15% (3 trials with 1,810 participants) (low-certainty evidence).
- Mostly nonserious and musculoskeletal adverse events; some others including exacerbations of osteoarthritic...
The authors concluded that structured exercise programmes are effective in reducing the rate of falls and the risk of falling, while their role is less certain for non-falls outcomes. Effective training is composed of balance and functional exercises, especially in reducing the rate of falls and the risk of falling. Also, more structured programmes, including resistance exercises with balance and functional training, and Tai Chi may reduce falls in the elderly living in the community.

These programmes lasted 12 weeks or over, even if it is common to have planned training lasting one year or more. Training is effective regardless of whether exercise is delivered individually or in groups, by health professionals or trained non-health professionals, to younger or older populations (based on a 75-year age threshold) or for people selected on the risk of falls. People may achieve longer-term benefits due to the modification of people habits.

The effects of other types of exercise such as resistance training (alone), dance or walking have less clear effects, while flexibility or endurance training were not evaluated versus control groups. Adverse events related to exercise may occur but they are predominantly minor (musculoskeletal, mostly).

### How did the authors conclude?

The author thanks Cochrane Rehabilitation and Cochrane Bone, Joint and Muscle Trauma Group for reviewing the contents of the Cochrane Corner.

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