Physical fitness training for stroke patients (Review)

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Physical fitness training for stroke patients

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Editorial group: Cochrane Stroke Group.


Review content assessed as up-to-date: 1 February 2015.


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ABSTRACT

Background

Levels of physical fitness are low after stroke. It is unknown whether improving physical fitness after stroke reduces disability.

Objectives

To determine whether fitness training after stroke reduces death, dependence, and disability and to assess the effects of training with regard to adverse events, risk factors, physical fitness, mobility, physical function, quality of life, mood, and cognitive function. Interventions to improve cognitive function have attracted increased attention after being identified as the highest rated research priority for life after stroke. Therefore we have added this class of outcomes to this updated review.

Search methods

We searched the Cochrane Stroke Group Trials Register (last searched February 2015), the Cochrane Central Register of Controlled Trials (CENTRAL 2015, Issue 1: searched February 2015), MEDLINE (1966 to February 2015), EMBASE (1980 to February 2015), CINAHL (1982 to February 2015), SPORTDiscus (1949 to February 2015), and five additional databases (February 2015). We also searched ongoing trials registers, handsearched relevant journals and conference proceedings, screened reference lists, and contacted experts in the field.

Selection criteria

Randomised trials comparing either cardiorespiratory training or resistance training, or both (mixed training), with usual care, no intervention, or a non-exercise intervention in stroke survivors.

Data collection and analysis

Two review authors independently selected trials, assessed quality and risk of bias, and extracted data. We analysed data using random-effects meta-analyses. Diverse outcome measures limited the intended analyses.
Main results

We included 58 trials, involving 2797 participants, which comprised cardiorespiratory interventions (28 trials, 1408 participants), resistance interventions (13 trials, 432 participants), and mixed training interventions (17 trials, 957 participants). Thirteen deaths occurred before the end of the intervention and a further nine before the end of follow-up. No dependence data were reported. Diverse outcome measures restricted pooling of data. Global indices of disability show moderate improvement after cardiorespiratory training (standardised mean difference (SMD) 0.52, 95% confidence interval (CI) 0.19 to 0.84; P value = 0.002) and by a small amount after mixed training (SMD 0.26, 95% CI 0.04 to 0.49; P value = 0.02); benefits at follow-up (i.e. after training had stopped) were unclear. There were too few data to assess the effects of resistance training.

Cardiorespiratory training involving walking improved maximum walking speed (mean difference (MD) 6.71 metres per minute, 95% CI 2.73 to 10.69), preferred gait speed (MD 4.28 metres per minute, 95% CI 1.71 to 6.84), and walking capacity (MD 30.29 metres in six minutes, 95% CI 16.19 to 44.39) at the end of the intervention. Mixed training, involving walking, increased preferred walking speed (MD 4.54 metres per minute, 95% CI 0.95 to 8.14), and walking capacity (MD 41.60 metres per six minutes, 95% CI 25.25 to 57.95). Balance scores improved slightly after mixed training (SMD 0.27, 95% CI 0.07 to 0.47). Some mobility benefits also persisted at the end of follow-up. The variability, quality of the included trials, and lack of data prevents conclusions about other outcomes and limits generalisability of the observed results.

Authors’ conclusions

Cardiorespiratory training and, to a lesser extent, mixed training reduce disability during or after usual stroke care; this could be mediated by improved mobility and balance. There is sufficient evidence to incorporate cardiorespiratory and mixed training, involving walking, within post-stroke rehabilitation programmes to improve the speed and tolerance of walking; some improvement in balance could also occur. There is insufficient evidence to support the use of resistance training. The effects of training on death and dependence after stroke are still unclear but these outcomes are rarely observed in physical fitness training trials. Cognitive function is under-investigated despite being a key outcome of interest for patients. Further well-designed randomised trials are needed to determine the optimal exercise prescription and identify long-term benefits.
about the impact of fitness training on other areas such as quality of life, mood, or cognitive function. Cognitive function is under-investigated despite being a key outcome of interest for stroke survivors. There was no evidence that any of the different types of fitness training caused injuries or other health problems; exercise appears to be a safe intervention. We need more studies to examine the benefits that are important to stroke survivors, in particular for those with more severe stroke who are unable to walk.

**Quality of the evidence**

Studies of fitness training can be difficult to carry out. This means most of the studies were small and of moderate quality. However, some consistent findings did emerge with different studies all tending to show the same effect.