Physical activity and enhanced fitness to improve cognitive function in older people without known cognitive impairment (Review)

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Physical activity and enhanced fitness to improve cognitive function in older people without known cognitive impairment

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ABSTRACT

Background
Physical activity is beneficial for healthy ageing. It may also help maintain good cognitive function in older age. Aerobic activity improves cardiovascular fitness, but it is not known whether this sort of fitness is necessary for improved cognitive function. Studies in which activity, fitness and cognition are reported in the same individuals could help to resolve this question.

Objectives
To assess the effectiveness of physical activity, aimed at improving cardiorespiratory fitness, on cognitive function in older people without known cognitive impairment.

Search strategy
We searched MEDLINE, EMBASE, PEDro, SPORTDiscus, PsycINFO, CINAHL, Cochrane Controlled Trials Register (CENTRAL), Dissertation abstracts international and ongoing trials registers on 15 December 2005 with no language restrictions.

Selection criteria
All published randomised controlled trials comparing aerobic physical activity programmes with any other intervention or no intervention with participants older than 55 years of age were eligible for inclusion.

Data collection and analysis
Eleven RCTs fulfilling the inclusion criteria are included in this review. Two reviewers independently extracted the data from these included studies.

Main results
Eight out of 11 studies reported that aerobic exercise interventions resulted in increased cardiorespiratory fitness of the intervention group (an improvement on the maximum oxygen uptake test which is considered to be the single best indicator of the cardiorespiratory system) of approximately 14% and this improvement coincided with improvements in cognitive capacity. The largest effects on cognitive function were found on motor function and auditory attention (effect sizes of 1.17 and 0.50 respectively). Moderate effects were observed for cognitive speed (speed at which information is processed; effect size 0.26) and visual attention (effect size 0.26).
Authors’ conclusions

There is evidence that aerobic physical activities which improve cardiorespiratory fitness are beneficial for cognitive function in healthy older adults, with effects observed for motor function, cognitive speed, auditory and visual attention. However, the majority of comparisons yielded no significant results.

The data are insufficient to show that the improvements in cognitive function which can be attributed to physical exercise are due to improvements in cardiovascular fitness, although the temporal association suggests that this might be the case. Larger studies are still required to confirm whether the aerobic training component is necessary, or whether the same can be achieved with any type of physical exercise. At the same time, it would be informative to understand why some cognitive functions seem to improve with (aerobic) physical exercise while other functions seem to be insensitive to physical exercise.

Clinicians and scientists in the field of neuropsychology should seek mutual agreement on a smaller battery of cognitive tests to use, in order to render research on cognition clinically relevant and transparent and heighten the reproducibility of results for future research.

PLAIN LANGUAGE SUMMARY

Physical activity and enhanced fitness to improve cognitive function in older people without known cognitive impairment

Physical activity is beneficial for healthy ageing. It may also help maintain good cognitive function in older age. Aerobic activity improves cardiovascular fitness, but it is not known whether this sort of fitness is necessary for improved cognitive function.

Eleven studies of aerobic physical activity programmes for healthy people over the age of 55 years have been included in this review. Eight of these 11 studies reported that aerobic exercise interventions resulted in increased fitness of the trained group and an improvement in at least one aspect of cognitive function. The largest effects were on cognitive speed, auditory and visual attention. However, the cognitive functions which improved were not the same in each study and the majority of comparisons yielded no significant results.

The data are insufficient to show that the improvements in cognitive function which can be attributed to physical exercise are due to improvements in cardiovascular fitness.