

## P32

## Exercise training for arterial stiffness in adults with hypertension. Where do we stand? A systematic review and meta-analysis

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### Background

The global burden of hypertension has been growing over time, largely driven by population growth, changes in lifestyle and ageing [1]. Arterial stiffness, namely pulse wave velocity (PWV), is an emerging biomarker in the assessment of vascular health and an independent predictor of cardiovascular events and all-cause mortality [2,3]. An increase of 1 m/s in carotid-femoral PWV (cfPWV) has been associated with a 15% increase in cardiovascular mortality [2].

Aerobic, dynamic resistance, combined and even isometric resistance exercise training lower BP among adults with hypertension [4,5]. Blood pressure (BP) is strongly correlated with PWV [6]. Nonetheless, Debate concerning the effect of exercise training on arterial stiffness in hypertensive individuals still exists.

### Objective

To Systematically review the effects of exercise training on arterial stiffness, namely Pulse Wave Velocity (PWV), in patients with hypertension; and to identify the possible moderator variables of the effect of exercise on PWV.

### Design

Systematic review with meta-analysis (PROSPERO CRD42019138658).

### Data sources

MEDLINE, EMBASE, Cochrane and Web of knowledge were searched up until July 2019.

### Eligibility criteria for selecting studies

RCTs assessing the effect of exercise interventions lasting 4 or more weeks on PWV in adults with hypertension.

### Results

We included 14 trials (15 interventions), involving 5 aerobic, 2 dynamic resistance, 6 combined, and 2 isometric resistance groups, totalling 694 subjects with hypertension. PWV was significantly reduced by exercise training [(WMD (95% CI) = -0.76 m/s (-1.05 to -0.47)]. Analysis of moderator variables showed that aerobic exercise [WMD (95% CI) = -0.70 m/s (-1.20 to -0.19)], combined exercise [WMD (95% CI) = -0.74 m/s (-1.41 to -0.08)] and isometric resistance exercise [WMD (95% CI) = -0.98 m/s (-1.24 to -0.73)] reduced PWV. There was no significant reduction in PWV in participants undertaking dynamic resistance training [WMD (95% CI) = -0.58 (-1.58 to 0.42)]

#### Keywords:

Exercise training, Meta-analysis, Arterial Stiffness, Hypertension, Adults

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## Conclusions

Aerobic, combined and isometric resistance exercise significantly decreased PWV in patients with hypertension. Despite the small number of studies, data from the isometric resistance exercise has the potential for the largest reductions in PWV. This meta-analysis demonstrates that exercise-based interventions based on aerobic, combined or isometric exercise are suitable to improve PWV in adults with hypertension.

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